SQUAW CREEK NWR - NARRATIVE REPORT -
1968

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SQUAW CREEK NATIONAL WILDLIFE REFUGE

PERSONNEL

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Maintenanceman (Seasonal). . . . . Walter J. Boyd

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Biological Technician (Resigned 2/23/68) Ronald D. Andrews

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UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE
SQUAW CREEK NATIONAL WILDLIFE REFUGE
MOUND CITY, MISSOURI

C O N T E N T S

1968

Narrative Report

Squaw Creek National Wildlife Refuge

I. GENERAL

A. Weather Conditions

Table 1. 1968 Weather Rosecrans Memorial Airport, St. Joseph, Missouri

	Precipitation				Max.	Min.
	Month	Normal	Snowfall		Temp.	Temp.
January	.27	1.20	.2		61	-14
February	.26	1.09	2.5		59	2
March	.81	2.33			86	10
April	4.99	3.15			85	22
May	3.13	4.39			92	32
June	2.35	5.93			94	47
July	7.59	3.22			95	46
August	4.78	4.21			96	55
September	2.10	3.44			86	41
October	3.32	2.18			88	26
November	1.52	1.68	Trace		74	16
December	2.08	1.36	1.0		66	-8
Totals	33.20	34.18	3.7	Extremes	96	-14

Information for the above weather summary was obtained from the U.S. Weather Bureau for their station at Rosecrans Memorial Airport, St. Joseph, Missouri - about twenty-five miles southeast of Squaw Creek National Wildlife Refuge.

Precipitation in 1968 was slightly below normal but sufficient for good crops of food plants. Snowfall and other winter precipitation were very light. Abnormal rains occurred in April, July and December.

Early January was subnormally cold with temperatures dropping to -14°F at St. Joseph. The summer months were hot but never higher than 96°F. The autumn was mild.

B. Habitat Conditions

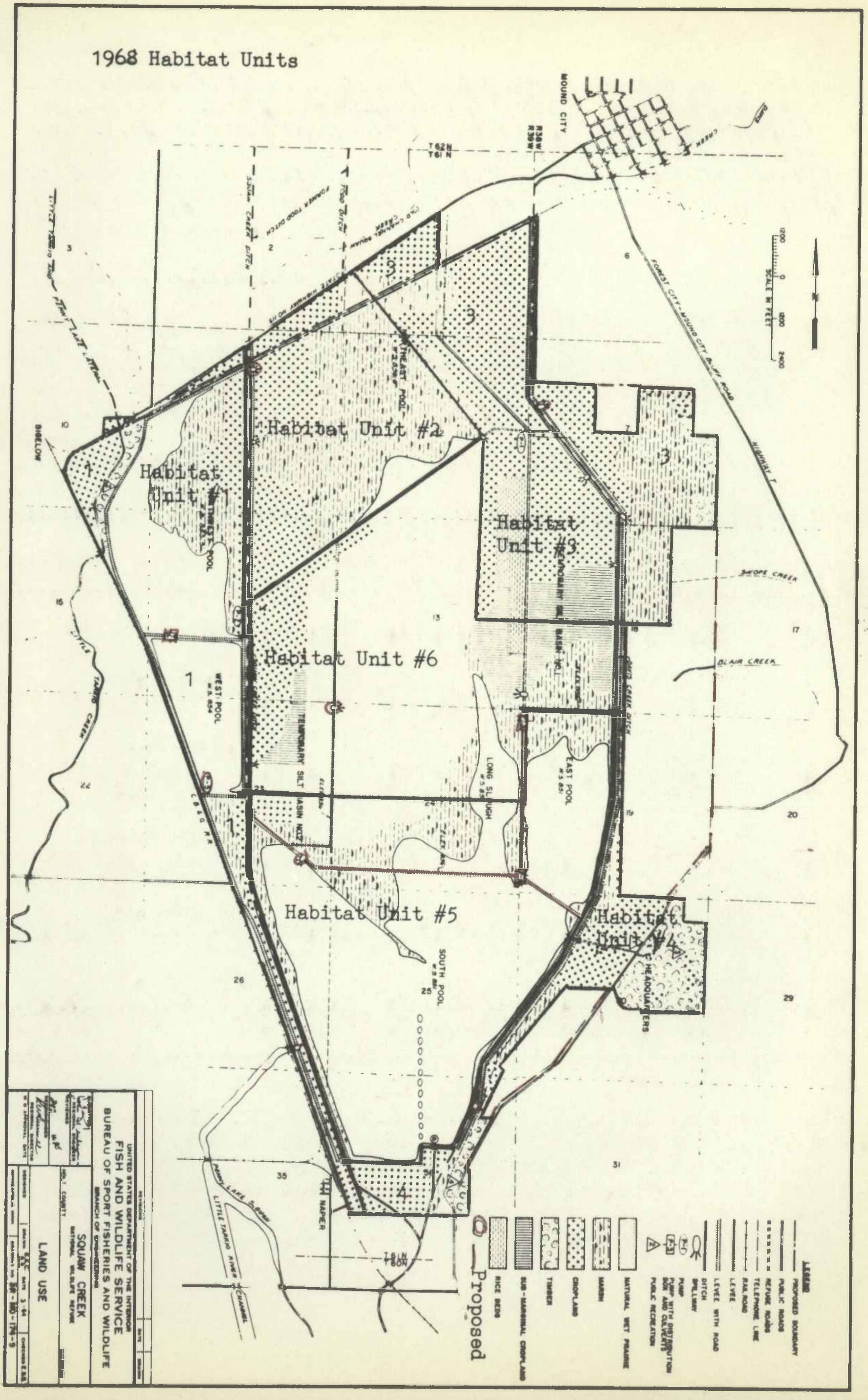
Waterfowl use days have been our primary indices for refuge water management since 1963 (see Table 2). But consideration has also been given to the relationship of other forms of wildlife to waterfowl use and to changes in habitat. Periodic vegetation surveys have supplemented the wildlife surveys and other observations.

Table 2. Waterfowl day use by habitat unit 1968

Habitat Unit	Acres	Water Areas	Goose Days 1967	Goose Days 1968	Duck Days 1967	Duck Days 1968	Waterfowl Days Use/A. 1968
1	870	West pools	2,240,420	3,743,572	2,244,382	2,440,487	7,108
2	880	No. Cent. Marsh	2,660,105	1,527,771	1,102,360	84,210	1,832
3	970	Bluff Pool, Paddies SB#3	3,195,346	3,066,245	1,501,346	536,816	3,714
4	590	Davis Creek and ponds	1,590,687	717,879	225,827	131,299	1,439
5	2,218	So. Long Sl. & Main Pool	7,321,517	5,921,818	13,539,736	10,516,756	7,411
6	1,321	No. Long Sl. and A-16	2,505,279	1,147,419	3,240,328	777,168	1,457
TOTAL	6,849		19,513,354	16,124,704	21,853,979	14,486,736	3,827*

*Average

In 1968 about 16 million goose days and 14 million duck days were obtained compared to about 20 million goose days and 22 million duck days in 1967. This reflects in part poor 1968 waterfowl production indicated by the geese and ducks using Squaw Creek during migration. The planned forced movements of potential wintering waterfowl during the current and past winter have also effectively reduced the total waterfowl day use.


1968 Habitat Units
Habitat Unit #1
Habitat Unit #2
Habitat Unit #3
Habitat Unit #4
Habitat Unit #5
Habitat Unit #6
MOUND CITY
BIGELOW
NAPIER
HEADQUARTERS
WEST POOL
EAST POOL
SOUTH POOL
LONG SLOUGH
NORTHWEST POOL
NORTHEAST POOL
TEMPORARY SILT BASIN NO. 1
TEMPORARY SILT BASIN NO. 2
SWOPE CREEK
BLAIR CREEK
LITTLE TARKIO CREEK
FOREST CITY - MOUND CITY BLUFF ROAD
HIGHWAY I
Proposed
LEGEND
PROPOSED BOUNDARY
PUBLIC ROADS
REFUGE ROADS
TELEPHONE LINE
RAILROAD
LEVEE
LEVEE WITH ROAD
DITCH
SPILLWAY
PUMP
PUMP WITH DISTRIBUTION BOX AND CULVERTS
PUBLIC RECREATION
NATURAL WET PRAIRIE
MARSH
CROPLAND
TIMBER
SUB-MARGINAL CROPLAND
RICE BEDS
UNITED STATES DEPARTMENT OF THE INTERIOR
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BRANCH OF ENGINEERING
SQUAW CREEK
NATIONAL WILDLIFE REFUGE
HOLT COUNTY
LAND USE
SCALE IN FEET

Nevertheless we believe that this is good management because (1) it distributes our waterfowl resources better in the Mississippi and Central Flyways, (2) it forces the waterfowl to move south of this potentially low temperature, low available winter food and water-stress zone, (3) it permits this refuge to approach closer to its approved wildlife objectives and (4) winter drawdowns help aeriate the soils and prepare the pools for maximum future food plant production.

Habitat Unit #1

We were unable to drawdown the west pools during the 1967-1968 winter but effective freezeup forced waterfowl out of this habitat in January. A buildup of waters began in late March and proceeded slowly through April making most of the marshes available to spring migrants and especially attractive to ducks. Insufficient water height was obtained however to control marginal weeds in the Northwest Pool. So its planned June 15th drawdown was delayed until July 1 (see Table 3). A 4½" local rain occurred on July 17 flooding the Northwest Pool and destroying its new crop of wild millet and associated moist soil food plants. A quick drawdown permitted a second crop to start in early August but it was set back by a 2" rain on August 10th. A late third crop of moist soil food plants finally succeeded but seed production was so low as to be almost unmeasurable. Geese however, did make excellent use of the green browse and root crop. Duck use of the Northwest Pool was less than normal.

Table 3. Impoundment data Northwest Pool 1968

Month	Average Elevation	Area (Acres)	Capacity Acre Feet
January	855.01	110	27
February	855.04	110	27
March	854.87	100	25
April	855.38	220	55
May	855.39	220	55
June	855.55	230	56
July	854.69	100	10
August	854.21	20	5
September	853.95	00	00
October	854.79	100	25
November	854.95	110	27
December	854.13	10	2
Average	854.85	111	26

The excessive precipitation of late July was apparently useful in vitalizing the invertebrate production in the West and Southwest Pools (see Table 4). These pools were managed as summer reservoirs and were very attractive to summer waders, early flight shorebirds and blue-winged teal. Blue-winged teal and pintail continued to use West Pool until they moved enmass to flooded moist soil food plant marshes in early October. Geese used the West Pool primarily as a watering and loafing area.

Southwest Pool is managed as a small experimental duck production pool and apparently provided little food for fall migrants. At least one pair of wood ducks reared a brood from a box in the Southwest Pool. Numerous sightings of wood ducks were made there and in Squaw and Little Tarkio Creeks and in levee barrows in Habitat Unit #1.

Table 4. Impoundment data West and Southwest Pools 1968

Month	Average Elevation	Area (Acres)	Capacity Acre Feet
January	853.41	110	28
February	853.65	130	32
March	853.84	150	37
April	853.79	140	35
May	854.18	160	40
June	854.29	170	42
July	854.61	200	50
August	854.23	160	40
September	853.95	150	37
October	854.01	150	38
November	853.76	140	35
December	853.03	50	12
Average	853.90	142.5	35.5

Habitat Unit #2

The "Northeast Pool" is so silted that it is better called the "North Central Marsh and Swamp". The pool no longer has any connection to its former 3' x 5' outlet structure and gauging station, but instead is drained during floods by a 100' rocked spillway and underlying 12" culvert. There was little surface water in this area during the spring and fall migrations so it was little used by waterfowl. Most waterfowl use was recorded in the adjacent grain and soybean fields. Green browse was so abundant on the refuge during 1968 autumn that giant Canadas did not use the underplantings of wheat browse in the cottonwood groves.

Excessive vegetation in the swamp portion of this habitat unit retarded wildlife use. Insufficient funds precluded the development necessary for a prescribed controlled burn.

Habitat Unit #3

Habitat Unit #3 contains Bluff Pool, Settling Basin #1, the fallow rice paddies and a portion of Davis Creek as its water areas. We are not currently interested in making Bluff Pool attractive to waterfowl during the hunting season because it is vulnerable to and almost surrounded by private Canada goose hunting clubs. We are interested in improving this area for spring and summer waterbird use and for a live refuge exhibit area when the adjacent rest areas are developed by Interstate I-29 Highway, now scheduled for 1974.

Settling Basin #1 received its overflow waters from Davis Creek. Flood waters settled their silt and debris in cordgrass and associated plants before they were permitted to flow toward the Main Pool. The lower basin remained wet until floods in mid-summer further augmented its water supply. Spring use by waterfowl was excellent. Wading birds used this area during the summer. Fall waterfowl use was curtailed by lack of water. Wood ducks began a fall roost but moved when the water seeped out.

The paddies were used as a marsh experimental area in 1968. The west paddies were disced and planted to oats. The oats were removed as green hay. Two paddies were then planted to early wheat for goose browse. Volunteer vegetation were allowed to grow in two of the mowed oats paddies. One of these was flooded and the other was left unflooded to measure the effect of flooding vegetation on waterfowl use. The results were reported in "Water and Habitat Management in Relation to Waterfowl Use at Squaw Creek Refuge" by Ed Zoch. The east paddies were planted to Proso millet but flood waters backed through the drains and destroyed this planting. These paddies were thereafter managed as a natural marsh and also were used in Mr. Zoch's observations.

Habitat Unit #4

The water areas in H-4 consist of the south portion of Davis Creek, its adjacent wet season ponds and the irregularly flooded A-19. This unit contains the upland headquarters and recreational areas and is the poorest for waterfowl on both unit and acre basis. In 1968 Davis Creek was low and the adjacent Wood duck, Blue-wing and Munkres Ponds were dry most of the year. No wood duck production was noted in the unit.

Food was scarce in A-19 during the spring migration and was inaccessible during the fall migrations until late November.

Habitat Unit #5

The water areas in H-5 consist of the Main Pool and the south portion of Long Slough. This unit was the most used by waterfowl on both unit and acre basis in 1967 and 1968. It had been a second class unit before it was brought under management for moist soil food plant production.

Water management, the resulting food plant production and waterbird use should all continue to improve in H-5 now that an effective outlet is available for the Main Pool.

An ineffective outlet and excessive precipitation in 1968 prevented a completely successful scheduled summer drawdown in the Main Pool (see Table 5). But early smartweeds and wild millet were sufficiently advanced that they endured short periods of high water and produced sufficient food for visiting waterfowl. Construction of the Squaw Creek cut-off south of the refuge, delayed the scheduled winter drawdown until subnormal temperatures froze the Main Pool to the ground at about a foot higher than planned. This subnormal weather forced most waterfowl south and the remnants off the refuge so that the drawdown was not needed for that purpose. A survey on December 31, 1968 found only 50 Canada geese, 350 snow geese, 150 blue geese and 1,000 mallards on the Main Pool ice and no waterfowl elsewhere on the refuge.

The south portion of Long Slough was important as a supplier of fresh water. A 12" culvert allowed Long Slough to be diverted into the Main Pool's East Bay. We did not find it opportune however in 1968 to install a lower control in Long Slough as planned. The portion above the cut-off was important to dabbling ducks and Canada geese until freezeup.

Table 5. Impoundment data Main Pool 1968

Month	Average Elevation	Area (Acres)	Capacity Acre Feet
January	850.38	1050	1500
February	850.44	1100	1500
March	850.19	1000	1400
April	849.00	800	600
May	848.00	700	175
June	848.91	800	600
July	849.88	900	1100
August	850.39	1050	1500
September	850.11	950	1150
October	848.96	800	1100
November	849.26	810	650
December	849.44	850	850
Average	849.58	900	1010

Habitat Unit #6

The only water areas in H-6 are North Long Slough, numerous water feeder ditches, Settling Basin #2, several stock ponds and the manageable marshes in A-16. Diverted Squaw Creek waters kept North Long Slough open and attracted considerable waterfowl. Late winter surface water on the grazing units also attracted some waterfowl. Large numbers of waterfowl and other waterbirds used flooded portions of A-16 throughout the year. But basically Habitat Unit #6 is a low fertility cordgrass prairie area where food production is poor and wildlife use will remain low until management can increase food production.

Flooded, mowed and grazed plots received heavy root grubbing use by geese and ducks. Grazed units provided loafing and feeding areas for large concentrations of geese.

II. WILDLIFE

A. Migratory Birds

Whistling Swans

Seventeen whistling swans visited this refuge in mid-November and two lingered to mid-December. In spite of a good "save-the-swans" publicity campaign at least two swans were shot in this vicinity. One specimen was mounted for our museum. The other crippled swan recovered in our goose clinic.

Canada Geese

In spite of our efforts toward dispersing wintering geese, about 4,000 large type Canadas mostly giants (Branta canadensis maxima) choose to winter in this vicinity in 1968. This flock built up to nearly 10,000 large Canadas by early March and then departed north.

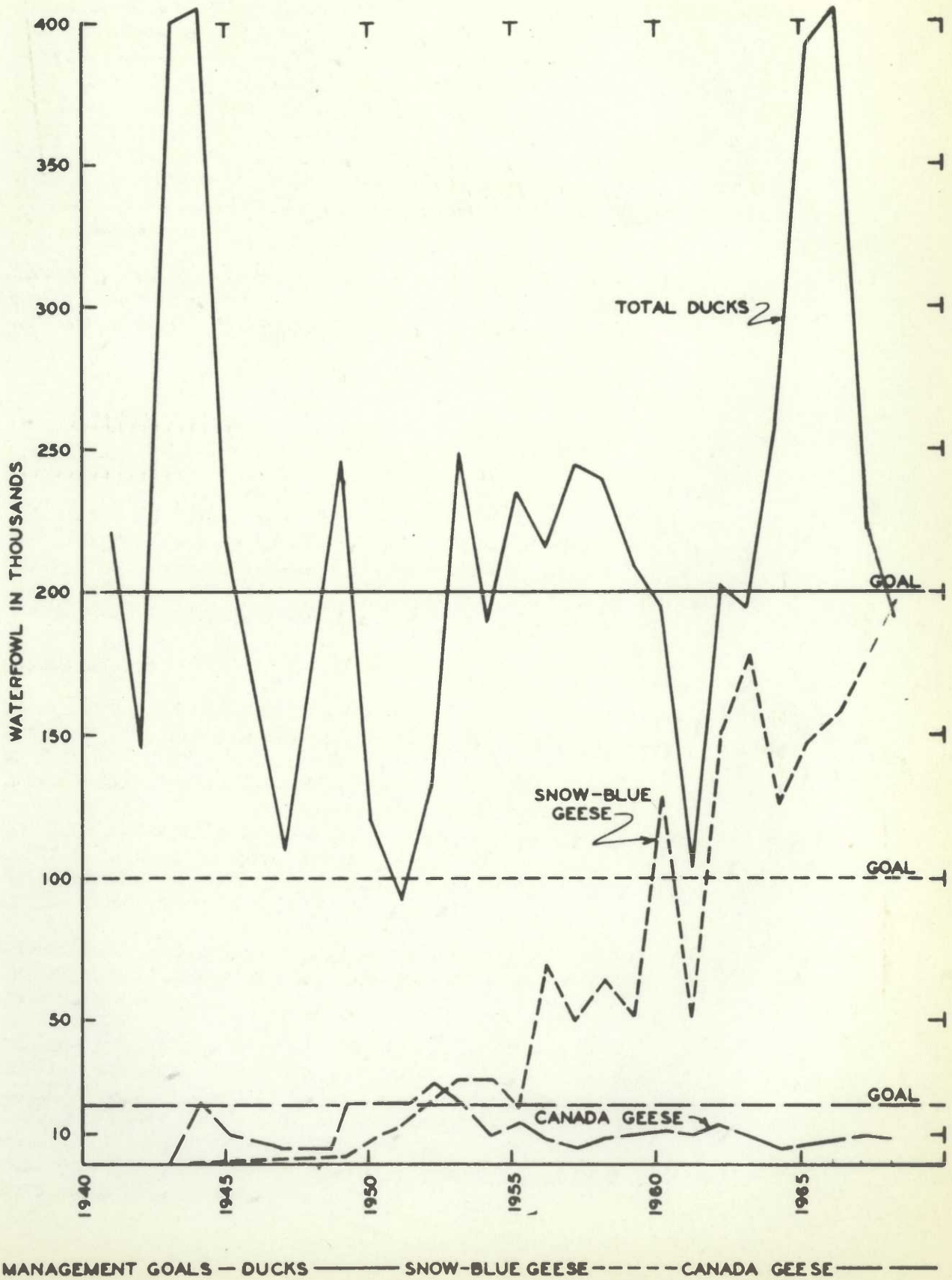
Twenty "short-necked" Canadas (typical Branta c. hutchinsii of the Central Flyway) visited during a mild period in late January. Small type Canadas did not appear again until early March. They peaked during the spring migration at 2,000.

One nesting attempt by a pair of giant Canadas did not materialize, but a pair of large Canadas did linger in this vicinity through the summer.

Twenty-eight large type and twenty small type Canadas appeared in late September. Large Canadas peaked at 6,300 in mid-December while small Canadas peaked at 1,500 in mid-November. The small Canadas included types known locally as "short-necks" and "cacklers". Our "cacklers" are extremely small and light breasted Canadas which our band recoveries indicate summer in interior Baffin Island and winter in Tamaulipas, Mexico.

GRAPH 1

PEAK FALL CONCENTRATIONS
SQUAW CREEK NATIONAL WILDLIFE REFUGE



Most Canada geese returned with few goslings to Squaw Creek this fall. Early migrants were thin.

White-fronted Geese

The first two white-fronted geese appeared February 27. Their population had peaked on Squaw Creek NWR at 2,800 by April 1 when checks of blue-snow goose migrations indicated five percent were also white-fronts. Early fall white-fronts appeared the first week of September but these apparently only paused briefly. White-fronts could be heard daily from September 23 to mid-December yet only 200 were actually sighted.

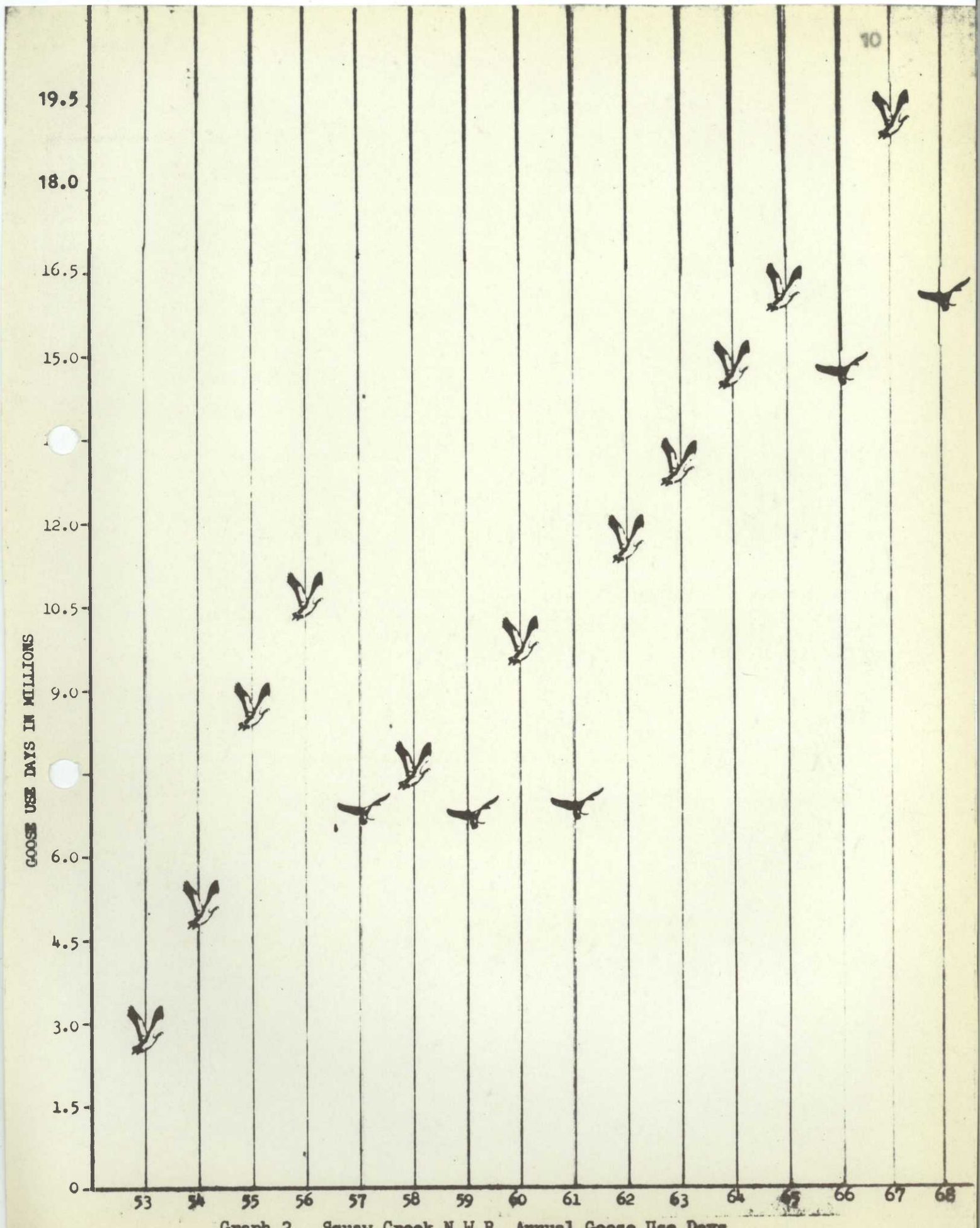
Blue-Snow-Ross' Geese

We entered 1968 with a remnant of 33 blue and 67 white geese. These had left the refuge by January 8th. About 10,000 lesser snow geese wintered on the Missouri River about ten miles south of the refuge and occasionally visited during mild days. This flock began to build up on the refuge by March 1. Their composition changed from 40,000 white and 20,000 blue geese on March 1 to 99,000 whites and 119,000 blues on March 15 to 215,000 whites and 215,000 blues on March 20, 1968. A few lingered on and off the refuge during the summer.

The first big fall influx of lesser snow geese occurred about October 1, 1968 with 85,000 whites and 25,000 blues. These geese had very few goslings and were in poor condition. Most of these apparently pushed on south as only about 32,000 white and 11,000 blue geese remained for the opening of the Missouri October 20th goose hunting season. The second peak of 129,000 white and 63,000 blue geese in late November was the highest fall peak ever recorded at Squaw Creek NWR. This peak was short-lived and was apparently caused by large numbers of geese from more northern areas staging here for their southward flight.

Paul Prevett, University of Western Ontario, estimated that twenty-five percent of the blue-snow geese observed from October 31 to December 9, 1968 were goslings and one per thousand were Ross' geese. Only a displaced remnant of 350 white and 150 blue geese remained at Squaw Creek by December 31, 1968.

An adult Atlantic brant was observed in late November with blue geese about twenty miles northwest of the refuge. No brant were actually observed in the milling throngs on the refuge this year but we assume some families came our way.



Graph 2. Squaw Creek N.W.R. Annual Goose Use Days

Ducks

Due to our winter dispersal program only fifty mallards remained at the start of the year and none were present the following week. About 20,000 mallards returned to the refuge during the third week of January. With milder weather this nucleus increased to a seasonal peak of 100,000 mallards, 100 black duck, 100 pintail and 500 common mergansers in early February but dropped to 6,200 ducks the following week.

A smaller peak, including 72,000 mallards, 100 black duck, 12,000 pintail, 30 teal and 500 common merganser occurred in early March. Pintail increased to about 16,000 in mid-March. Green-winged teal numbers built to 3,100 and shovelers built up to 4,580 in early April. Blue-winged teal numbers and use were down. They peaked at 3,100 in early April and used the refuge for about a tenth of their 1967 spring visit.

Both total duck use and peak numbers for the January 1 - April 30 period were about a third of the numbers reported for a similar period in 1967. It appears that the winter dispersal program adversely affected the spring migrant duck use. Some modifications of the winter dispersal program may therefore be needed to best serve the duck resource.

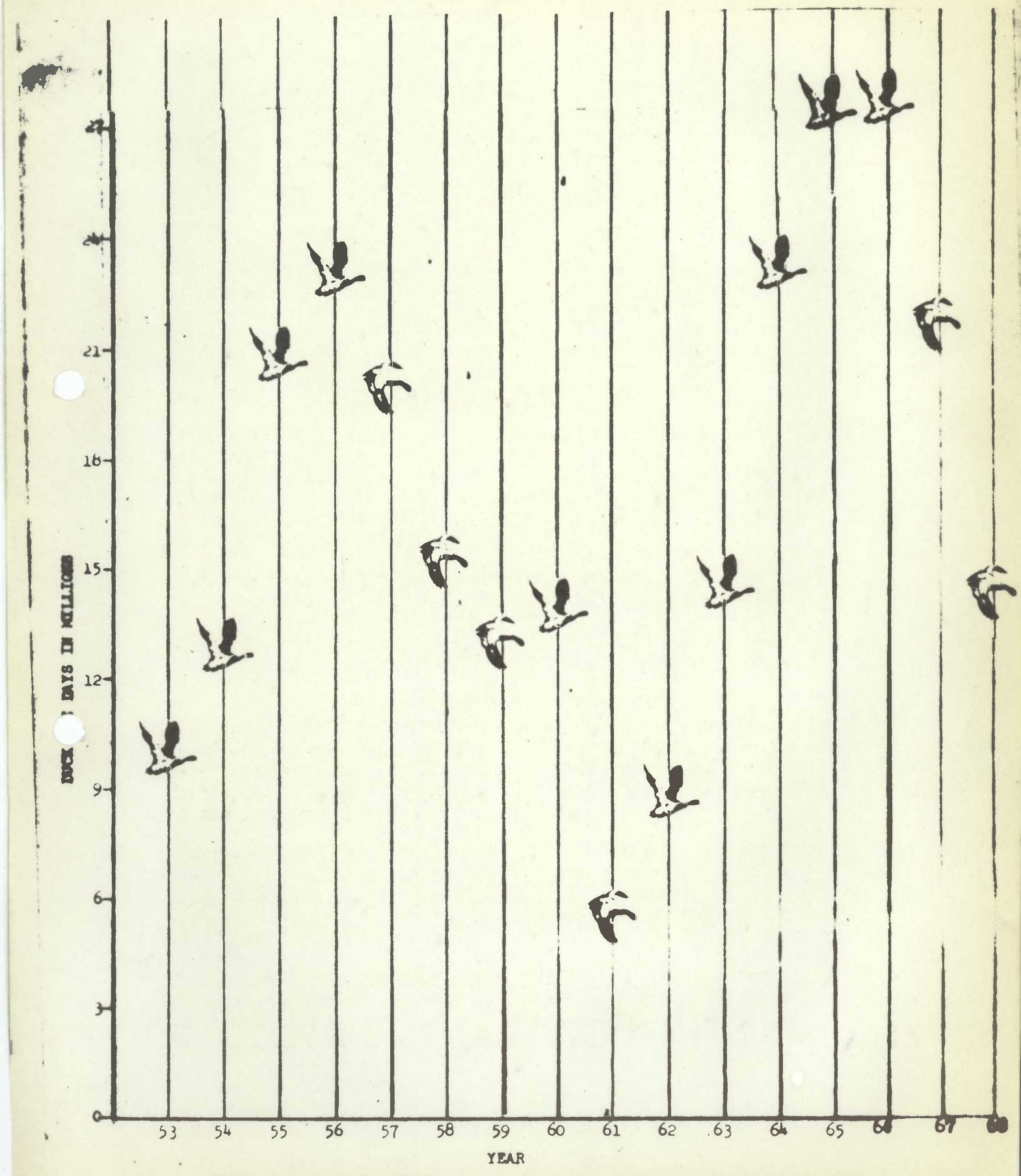
About 100 mallards, 12 wood duck and a few other ducks spent the summer at Squaw Creek. Only the wood duck were successful nesters.

The fall duck migration began in early August with 250 mallards, 200 pintail, 150 green-winged teal, 700 blue-winged teal and 180 wood duck.

The dominant mallard peaked at about 169,000 in late November-early December but were down to 1,000 by December 31, 1968. A few black duck appeared with the mallards. Gadwall appeared in September and increased to 5,000 in October. American widgeons appeared in late August and peaked at 10,000 in October.

Second-ranked pintail peaked at 50,000 in October and obtained over two million days use after September 1. Third-ranked green-winged teal peaked at 40,000 in early November and obtained over a million days use after September 1. Fourth-ranked blue-winged teal peaked at 14,000 in late October.

A few shovelers remained through the summer. They peaked at 5,000 in mid-November but departed with "freeze downs". The early August migration of 180 wood duck was also that species' peak. Wood duck had abandoned Squaw Creek Refuge's drained marshes by December 1.



Duck Use Days In Millions At Squaw Creek National Wildlife Refuge

Ring-necked ducks appeared and peaked at 500 in mid-October. Scaup appeared in late October and peaked at 2,100 in mid-November. Ten red head, 10 canvasback, 4 goldeneye, 12 common merganser and 8 hooded merganser appeared in mid-November. Bufflehead appeared in late October and peaked at 100 in mid-November. Ruddy duck appeared and peaked at 20 in early October.

It was quite apparent that the November 25th pre-winter drawdowns of A-16 Marsh and the west pools was quite effective in dispersing all ducks except those mallards that concentrated in Main Pool. The remaining mallards were dispersed in mid-December after the completion of the "Cannon Drainage Cut-off" permitted lowering the Main Pool and "freeze down" occurred.

The time and degree of pre-winter drawdowns and flooding of the Main Pool will be very critical to our future waterfowl management. More thought and imagination must be given to the flyways' and refuge's waterfowl goals to obtain the optimum results here from this type of habitat manipulation.

Other Water and Marsh Birds

Four eared grebe appeared May 5th. This species peaked at fifteen in mid-May and departed. Three reappeared September 8th and were last observed September 22. Horned grebe are even less common at Squaw Creek. Two appeared September 22 and one was sighted October 12. Three pied-billed grebe appeared March 18. A few stayed through the summer but they apparently did not nest on the refuge as they did in 1967. A peak of 50 were observed in early October. The last grebe was sighted October 30.

Eight white pelican appeared March 31; 2,000 were present in mid-April. Few pelican were observed on the refuge from April 25 until 170 reappeared in late August. White pelican peaked at 5,000 in mid-September. The last two displaced pelicans were observed on the refuge December 1.

A few double-crested cormorant must have slipped through this refuge during the spring migration but none were recorded. The peak number, five, were observed in late summer and one remained until October 25. Two great blue heron appeared March 28. They peaked at 107 in July and August and 72 remained until October 25. The last great blue heron was sighted on Squaw Creek Refuge on November 10.

A green heron appeared April 15. A pair may have nested on the refuge. They peaked at five in August and the last green heron was sighted September 20. A little blue heron was sighted on March 29, July 1 and August 18.

Three cattle egrets appeared June 14 and one stayed until June 22. The peak numbers however were fourteen cattle egret that migrated through on September 6. The first common egret appeared April 17. They peaked at ten the following weeks and the last four were observed September 15.

A black-crowned night heron appeared April 14. They peaked at 57 in late August and the last five black-crowns were reported September 29. A yellow-crowned night heron was reported April 16. They peaked at seventeen in late August and were last reported September 15.

An American bittern was sighted April 17. At least three were present during the summer. Seven were reported September 1-22 and none were sighted thereafter. A least bittern was noticed May 2. Six least bitterns were present May 20-26 and they may have nested but none were noted after September 1.

A glossy ibis was noted on April 14. A sandhill crane appeared March 6 and nine were present March 17-23.

The first king rail was noted May 15. This species nests on the refuge and produced about fifteen young in 1968. The last king rail was noted September 14.

The first Virginia rail was noted May 1. They peaked at 41 during May 6-12 and the last one was noted June 1. The first sora was noted May 1 they also peaked at about 40 in early May but some stayed all summer. The last 30 were observed September 22.

A study of thirteen years of wading bird data indicates that heron numbers increased with the increase of aquatic animal food after effective flooding of abundant vegetation grown on drained pools. Apparently the most aquatic animal food usually occurred with flooding the second year after a drawdown.

The reduction in numbers of herons due to the destruction of nearby heronies can not be directly measured on the refuge. But the last great blue heronry is seriously threatened now that the Cannon Drainage District has drained the area south of the refuge for agriculture. Some techniques for attracting these remnant nesting flocks to suitable refuge areas are critically needed to save this natural resource.

Shorebirds

A killdeer on March 8 was the first shorebird. Killdeers peaked at 45 during the spring migration. At least three pairs nested and produced six young. Two nests were located on the west crushed-rock road and one of these was successful. Killdeers peaked at 50 during the fall migration and the last 12 were observed December 1.

Table 6. Herons' and other wading birds' peak populations, Squaw Creek National Wildlife Refuge

Years	(1) Water Levels	American Bittern	Gr.Bl. Heron	Green Heron	B-c Nite Heron	Y-c Nite Heron	Common Egret	Cattle Egret	Little Bl.Heron	Least Bittern	Index Total
1956	- -	8	100	12	7	0	6	0	0	0	133
1957	- -	16	100	12	6	0	6	0	0	0	140
1958	- +	0	few	200	200	100	200	0	700	0	1,400
1959	+ +	few	few	200	300	few	200	0	30	0	730
1960	+ +	0	50	17	200	3	33	0	10	0	313
1961	+ +	ND	50	15	5	5	20	0	0	0	95
1962	+ +	1	65	9	50	2	52	0	23	6	208
1963	+ -	0	202	5	2	2	16	0	1	0	228
1964	+ +	2	100	6	27	6	2	0	55	6	204
1965	+ +	1	64	6	11	4	5	0	7	2	100
1966	- -	3	103	10	15	13	15	0	19	5	183
1967	- -	2	350	14	5	17	6	1	7	6	408
1968	+ -	3	107	5	57	17	12	14	1	6	222

(1) Water levels in the Main Pool are indicated as low (- -), high (+ +) or changing from low to high (- +).

An American golden plover appeared March 24. They peaked at 22 April 14-20 and the last two of the spring migration were noted May 18. A fall migrant was noted September 21 and two were present November 18-30.

A semi-palmated and a piping plover were noted April 14. The semi-palmated plovers peaked at 400 in early May and the last four were noted September 22. Five piping plovers were noted April 21-30 the last four were noted September 22. Both species were absent for a short time during the summer.

A rare (for this area) snowy plover was again observed on July 7 by Floyd Lawhon, expert member, St. Joseph Audubon Society. This species should now be added to our bird list as a rare spring-summer visitor.

Two black-bellied plovers appeared May 4. They peaked at 30 during May 12-19 and departed. Two reappeared and were last observed December 1.

Five ruddy turnstone appeared May 18. They peaked at eleven in mid-May and the last one was noted June 2. Although not listed in the NR forms several American woodcock were flushed on the refuge during the 1968 spring.

Fifty common snipe appeared March 31 and peaked at 100 during May 6-12 and departed. One snipe reappeared September 1, peaked again at 100 during November 11-17. The last 20 common snipe were noted December 1.

A long-billed curlew appeared April 30 and departed May 14. An upland plover was observed the second week of July. Fourteen willets appeared April 28. They peaked at 25 in early May and departed. A lone willet was also observed August 4.

Seven spotted sandpipers appeared May 9. They peaked at 14 in mid-May. Spotted sandpiper probably nested and may have produced nine young. The last three spotted sandpipers were noted September 15. Two solitary sandpiper appeared and peaked May 4. The last solitary was noted September 14.

Two greater and two lesser yellowlegs appeared March 17. The greaters peaked at 13 during the first week of May. A pair remained all summer and the last one was noted November 2. Lesser yellowlegs peaked at 2,400 the first week of May. A few remained during the summer. The last yellowlegs was noted November 27.

Ten pectoral sandpipers appeared March 24. They peaked at 400 during the first three weeks of May. A few pectorals stayed over summer. The last two fall migrants were noted December 1.

Two hundred white-rumped sandpipers appeared May 5. They peaked at 500 during May 5-20 and the last 30 were noted June 16. Two Baird's sandpipers appeared March 17. They peaked at fifty in early May and departed. The last two fall migrant Baird's were noted November 17. Ten least sandpipers were observed May 4. They peaked at 220 the second week of May and departed. Ten reappeared September 1, peaking at 15 the following week. The last four were noted September 22.

Dunlins peaked at 300 during May 20-26 and departed. Twenty reappeared November 3-17 and the last three hardy dunlins were noted November 28.

We leave the field identification of the short and long-billed dowitchers up to the most skilled and persistent members of the St. Joseph Audubon Club. According to their records and ours 100 dowitchers first appeared April 15th. Short-billed peaked at 200 during May 1-14. Both species peaked at about fifty each during mid-October with the last two long-bills noted November 16.

Stilt sandpipers appeared about May 1. They peaked at 700 May 13-19 with a few remaining over summer. The last 40 were observed September 22. Semipalmated sandpipers appeared about May 1. They peaked at 150 in mid-May with a few remaining until the fall migration. The last six were noted September 8.

A western sandpiper appeared May 19 and again on September 1. A buff-breasted sandpiper appeared May 5. Twelve were present August 19-31. The last five were noted September 7.

A marbled godwit appeared April 14. They peaked with four in mid-May. The last one was noted July 21.

Fifty hudsonian godwits appeared April 19. They peaked at 70 during mid-May and the last eight had departed by May 20.

A sanderling appeared May 5. They peaked at 30 in mid-May and departed. Five sanderlings reappeared September 15 and had departed by September 25.

Five American avocet appeared April 15. They peaked at 40 in early May and departed. An avocet reappeared on September 8, peaked at twelve in late September with six staying until November 10.

Wilson's and northern phalaropes first appeared about May 1. Wilson's peaked at 600 May 6-12 and one remained over summer. The last Wilson's phalarope was noted November 17. Northern phalarope peaked at 82 in mid-May and departed. One northern phalarope was again noted September 21.

Gulls and Terns

Three herring gull appeared and peaked February 6. The last herring gull was noted May 19. Three ring-billed gull appeared February 4. They peaked at 400 during mid-May. The last two were noted December 1. Twenty Franlkin's gull appeared April 14. They peaked at 100 during the spring migration and at 1,500 during the fall migration. The last three Franklin's gull were noted November 3. Two Bonaparte's gull appeared April 26 and peaked at 29. The last five Bonaparte's gull were identified August 14.

A Forester's tern appeared April 18. They peaked at 14 in early May and three were identified September 1. Two common tern were identified May 19. Another common tern was noted June 23.

Six Caspian tern appeared May 18. They peaked at 30 in late May and departed. Two fall migrants were noted September 1. A black tern appeared May 8. They peaked with 1,525 in mid-May and remained over summer. The last 40 were noted September 7.

An immature jaeger over Squaw Creek Refuge was reported by John Hamilton in early October. It didn't stop and the species could not be ascertained due to its immature tail feathers.

Doves

A few mourning doves over-wintered at Squaw Creek Refuge. Their numbers increased to 100 in mid-February and to a peak of about 300 in August. About 100 fledgings were produced on the refuge. The last dove was noted December 27.

B. Upland Game Birds

About 200 ring-necked pheasants and 50 bob-whites wintered on Squaw Creek Refuge. Nesting was fairly successful. About 375 pheasants and 175 quail were using the refuge during December 1968.

C. Big Game Mammals

White-tailed deer were commonly observed on Squaw Creek National Wildlife Refuge during 1968. Production was good with about fifty fawns produced. About 200 white-tails used the refuge during periods of greatest use. At least three deer were taken on the refuge boundary during the October 1 - December 31, 1968 archery season. Many more were taken in this vicinity by guns during the November 16-19 any deer season. A few additional forked-antler bucks were taken during the November 30 - December 7 trophy hunt. White-tails again spread over the adjacent rural area after these harassments only to be periodically chased back into the refuge by true blue coon and wolf hounds.

D. Furbearers, Predators, Rodents and Other Small Mammals

Form NR-4 for year ending April 30, 1968 indicated that 30 opossum, 200 cottontail, 4 wood chuck, 5 Franklin's ground squirrel, 20 gray squirrel, 400 fox squirrel, 40 pocket gopher, 10 beaver, 200 muskrat, 20 coyote, 2 red fox, 2 gray fox, 200 raccoon and 40 mink were using the refuge.

In addition, short-tailed shrew, red bat, western harvest mouse, deer mouse, prairie vole, Norway rat and striped skunk were listed as common. Least shrew, southern lemming and badger were listed as uncommon. Eastern mole, white-footed mouse and house mouse were listed as abundant while meadow jumping mouse, long-tailed weasel and bobcat were listed as rare.

The status of small mammals can change rapidly. In December 1968 we estimated 60 opossum, 400 cottontail, 5 wood chuck, 20 beaver, 500 muskrat, 40 coyote, no red or gray foxes, 400 raccoon and 50 mink. Listed under abundant were deer mice, white-footed mice and house mice. Eastern moles, prairie voles, Norway rats and pocket gophers were common during the summer. Signs of short-tailed shrew, least shrew, red bat, western harvest mouse, southern lemming, meadow jumping mouse, long-tailed weasel, striped skunk, badger and bobcat were rarely observed during 1968.

Refuge Leaflet 327 "Mammals of Squaw Creek National Wildlife Refuge" was printed and distributed in June 1968. It lists 34 mammals that have recently been identified on the refuge by Dr. Richard Myers, University of Missouri at Kansas City, Professor David Easterla, Northwest Missouri State College, their students or members of the refuge staff. A hypothetical list of 14 additional mammals occurring in adjacent counties are included to stimulate further interest.

E. Vultures, Hawks, Eagles, Owls and Crows

The first turkey vulture appeared about May 1. They peaked with three the first week of May. A pair may have nested on the refuge. A sharp-shinned hawk was noted March 2 and a pair were probably present all winter. A sharp-shinned hawk was also noted September 15 and October 9.

A pair of Cooper's hawk were present all year. Twenty-four red-tailed hawk were present during the winter and six stayed over summer. They probably nested on the refuge. Red-tails peaked at 37 on December 21.

Three Harlan hawks were present January 1, 1968. They departed in late winter. A Harlan hawk reappeared in early November and they again peaked at three. A red-shouldered hawk was noted March 17, and May 1. A broad-winged hawk was noted August 18 and September 14. Two Swainson's hawks were noted April 7.

Twenty-one rough-legged hawks were present and peaked January 1, 1968. They departed in late winter and one reappeared October 4. Four rough-legs were sighted during the Christmas Bird Count of December 21, 1968.

A golden eagle was noted January 1, 1968. Three were present in late February and one stayed until March 31. Two golden eagles reappeared October 28 and four were present during November 18 - December 28.

Forty-six bald eagles were present January 1, 1968. They peaked at 105 during February and one immature remained in the vicinity all summer. The first migrant bald eagles reappeared October 4 and peaked with 104 immatures and 70 adults in December.

Ten marsh hawks were present January 1, 1968 and remained over winter. A pair probably nested on the refuge during the summer. They peaked at 20 during November and December.

An osprey was sighted May 19. A peregrine falcon was sighted May 3 and 16. A pigeon hawk was noted October 9 and December 8. A pair of sparrow hawks stayed all year and may have nested in the vicinity. Four pairs of screech owls used the refuge all winter. A pair nested and reared young in a metal wood duck house.

Great horned owls are permanent residents. They peaked at 40 in April including the production and at least six were on the refuge at the year's end. Barred owls are also permanent residents. They peaked with about ten including the young produced in a hollow tree near the office. Six barred owls remained through December.

At least two long-eared owls were present during the winter and reappeared again in mid-November. Twelve short-eared owls were present during the winter. They reappeared and peaked with 20 during December. Two rare saw whet owls made their home in the headquarters red cedars January 1 - March 30 and were often photographed.

Eight crows were present January 1, 1968. They peaked at 500 during the late winter migration. At least one pair nested on the refuge. Only about four crows remained on December 31.

F. Other Birds

Birds of Squaw Creek National Wildlife Refuge, RL 155 R-2 July 1966, included 253 visitors and 23 accidentals. Included as accidentals are cattle egret, brant, Ross' goose, snowy plover and whimbrel which later study indicates should be listed as visitors. Ruff, northern waterthrush, sharp-tailed sparrows and Lapland longspurs should be added to the accidental list in the next revision.

This "Christmas Bird Count" was made December 21, 1968. Mr. and Mrs. Fitzhugh Diggs, Hamburg, Iowa, Mr. and Mrs. John Hamilton, St. Joseph, Prof. David Easterla, Maryville, Missouri and Mary Burgess participated with the manager as compiler. The temperature was near 30°F with drizzling weather. Fifty-two bird species and 214,655 individuals were observed within seven and one-half miles of the refuge center. White-fronted and Ross' geese and golden eagles were unusual at this time of year. The 37 red-tailed hawks, 162 bald eagles, 38 marsh hawks and 900 Lapland longspurs were unusually large numbers for this area. The 64,000 red-winged balckbirds were impressive but a far cry from the 15,000,000 observed during the 1965-66 winter. Purple finches are rarely seen here.

G. Fish

Most fishes were eliminated from the refuge pools during the 1966 drouth and subsequent drawdowns. Some carp and bullhead fishing was obtained from Squaw Creek and diversion drains in 1968.

On July 16-17 Biological Technicians McClain and Butts sampled our two barrow pits that have been maintained as fishing ponds. The north pond is subjected to periodic flooding. Samples indicated that bullheads and sunfish made up 56 and 44% of the fish in this pond.

Fishery Services advised that this pond be maintained as a bullhead and carp fishery.

The south pond is not subjected to flooding. Samples indicated good bluegill but poor bass reproduction. Fishery Services advised clearing turbidity and stocking 250 fingerling large mouth bass. A shipment of 200 large-mouthed bass was mailed in a plastic bag from Valentine, Nebraska in mid-September. Only four were alive when we received them.

H. Reptiles and Amphibians

Snapping turtles were too large and numerous for good refuge management. Painted turtles were commonly observed and leather-backs were occasionally sighted.

A few massassauga rattlesnakes were observed in or near the gumbo soil areas. Their presence kept employees alert and the public on the roads. Garter, DeKay's, milk, blue racer, black, bull and water snakes were commonly observed during the summer.

Bull frog, leopard frog, tree frog, spring peeper, Rocky Mountain toad and Great Plains toad were commonly observed.

Development of a proposed refuge leaflet listing the Squaw Creek Refuge's reptiles and amphibians proceeded slowly.

I. Disease

We believe that few waterfowl died of lead poisoning after the 1967 hunting seasons due to our efforts in encouraging owners and managers to drain their duck ponds at the close of the duck hunting season and to otherwise disperse waterfowl from this area. We know of no fowl cholera or similar disease in the Squaw Creek waterfowl in 1968.

III. REFUGE DEVELOPMENT AND MAINTENANCE

A. Physical Development and Maintenance

In spite of the 1964 Master Development Planning and Programing no development funds have been made available to carry out that planned development.

However, $30,000 were made available in 1968 for developing public sanitary facilities. A fine appearing, gas heated, 17' x 24', comfort station connected by a 4" sewer 800' long to a 75' x 125' new sewage lagoon and by 1,285 linear feet of 2" waterline to an existing well were all built by the Newton Bridge Company, Savannah, Missouri.

Electrical, sewage and water hookups for a house trailer and an electric meter system changeover were added from our regular operating funds. The comfort station should be a big help in serving our expected 50,000 annual visitors.

Holt County Drainage District #2 began cleaning out and straightening the portion of Little Tarkio Creek that crosses the northwest corner of the refuge. With the exception of skinning the wrong side of the creek and attempting to operate without a plan the contractor was doing a fair job of meeting our cooperative agreement.

Holt County Cannon Drainage District constructed a cut-off on Squaw Creek from the Napier Road Bridge to Five Mile Lane. This should permit better drainage and faster drawdowns in the future.

Considerable time was spent maintaining about thirty miles of crushed rock and dirt roads and trails. The October breakdown of our Adams road grader prevented pre-winter preventative road maintenance and allowed our roads to deteriorate badly before a Caterpillar grader could be transferred from Seney NWR.

Two settling basin gumbo dike roads were sanded. About one-fourth mile of Davis Creek was cleaned and its spoils spread with the link-belt dragline. The spillway to Bluff Pool was lowered slightly. The Main Pool outlet ditch was cleaned to the south refuge boundary.

Floods and high waters occurred several times in early July demanding some interesting and long night hours by the field crew. The Davis Creek Levee was overtopped into Agricultural Unit #8 resulting in some levee damage and some debris in the corn field.

Considerable time was spent renovating the three desilting basins for winter wheat browse crops.

Deep well pumps #1 and 2 were overhauled and their water distribution systems were maintained.

Many man days were used in 1968, maintaining, repairing and overhauling ancient and inadequate equipment. Some units overhauled were the Linkbelt and P&H draglines, the Lorain backhoe, the mobile crane, D-8, TD-18, John Deere, Ferguson and MM tractors, rotary mowers, International tractor mowers and all vehicles. The Case tractor mower was transferred to Swan Lake NWR. The D-7 tractor, Studebaker Lark, 1959 Ford Country Sedan, Willys Jeep and several other unservicable pieces of equipment were declared excess.

A 1968 Chevrolet Sedan Delivery was finally received in December. In addition two Willys utility jeeps (one for salvage), a Wisconsin motor-lift pump and many D-8 tractor parts were received as surplus property through Mark Twain NWR.

Wildlife surveys were made often and reported weekly. Data obtained was inadequate for current management. Sufficient funds and trained manpower were not available to do the desired job.

The regular crew gave considerable help to the vegetation surveys conducted by Student Laborer John Hosking and to the goose use survey conducted by Ed Zoch and both reported under Part V.

Considerable effort was made by our staff in trapping mourning doves, blue-winged teal, blue geese, snow geese and Canada geese. Missouri Department of Conservation supported State Aid Charles Shaiffer's goose trapping efforts in December. Waterfowl trapping results are snown in Part V.

B. Planting

Cooperative farmers planted 610 acres of corn in 1968. Yields were fair, averaging about 85 bushels per acre. Shareing was normally accomplished by the cooperator taking six rows and leaving four rows of standing corn. The standing corn served as a good self-feeder and insured that some corn remained for the spring migrants.

Cooperative farmers also harvested about 6,500 bushels from 325 acres of early soybeans under a two crop plan whereby they planted the soybean land (and an additional 20% in area) to winter wheat for the refuge share of soybeans. This technique worked well in getting much green browse at no cost to our limited budget while insuring that all waste soybeans were contacted and softened by soil moisture thus eliminating danger (if any) of soybean impaction to geese.

Actually these fields proved the most attractive to Canada geese and effectively reduced Canada goose use of corn fields. It appeared that Canada geese preferred bean sprouts and swollen soybeans along with green wheat shoots to other feed.

Including the soybean areas, about 705 acres were planted to winter wheat and Elbon rye browse in 1968. The moist autumn produced a good browse crop throughout the refuge. An excellent supply of green browse remains for the spring migrant.

About 80 acres of oats were planted by Grazing Permittee Trimmer as a cover crop for pasture renovation and as a browse crop. These oats were harvested as hay and fed in the grazing unit.

About 17 acres of oats were planted in A-14 to control shattercane. The cooperative farmer received 75% and the refuge 25% of the harvested oats.

Cooperative farmers harvested 2,490 bushels of wheat for themselves and 1,590 bushels for the refuge under various cooperative agreements and addendums.

Nine acres of Elbon rye was harvested for refuge seed. About ten acres of Elbon rye and 252 acres of winter wheat browse were not harvested due to excellent use by geese or to the field's wet soil condition. They instead were plowed under as green manure or served as a volunteer fall browse crop.

C. Collections and Receipts

The refuge received about 875 acres of shelled corn, 1,590 bushels of wheat seed, 270 bushels of Elbon rye, 150 bushels of oats and 200 pounds of combined bromegrass seed through its cooperative farming and custom combining programs.

We purchased 50 pounds of Ladino clover, 360 pounds of Alsike clover and 450 pounds of Reed Canary grass for pasture renovation. We purchased 20 pounds of sunflower for seeding small bird feed patches.

D. Control of Vegetation

About twenty man days were spent clearing, burning and spraying weeds on ditch banks and levees. About twenty acres of willows and other broadleaf weeds on Davis and Squaw Creek Levees were sprayed with 2-4-D Ester L.V. at the rate of 1 lb. a.e. and 5 gallons of water per acre. Good early and local kills were obtained.

Five acres of Johnson grass on the Western Bell Telephone right-of-way were treated in late July with 7 lbs. of Dalapon and 25 gallons of water per acre. This treatment was too late to eradicate this pest but it did retard growth.

Atrazine was used by cooperative farmers on 450 acres of corn land to control grasses and it was generally successful. Ramrod was used on 160 acres of corn with fair success. Ramrod's advantage over Atrazine is its ease of application.

About 610 acres of corn was sprayed with 1½ lbs. a.e. of 2-4-D Amine and 20 gallons of water per acre to control broadleaf weeds during the summer. Morning glories and other late growing weeds still gave the cooperative farmers some difficulties.

All 325 acres of soybean land was treated with 1½ lb. of Treflan and 20 gallons of water per acre. Treflan did a good job in controlling weeds in early planted-early maturing soybeans but a poorer job in controlling sunflowers and shatter cane in later maturing soybeans. Treflan was used instead of Amiben because we believed it had a shorter carry over period for retarding the follow up crop of winter wheat browse. Additional details of pesticide applications are available in form NR-12.

Our most difficult weed was shatter cane which has invaded several corn and soybean fields. Efforts so far to eradicate this pest in corn or soybeans with chemicals have been unsuccessful. Our best approach has been a crop rotation including oats and alfalfa-brome hay. A more effective approach has been our early soybean-winter wheat cropping system where any maturing shatter cane is removed from the soybeans by hand.

E. Planned Burning

Burn Units 2 and 3 were inspected and prescribed burned on February 8, 1968 to prepare that area for cattle and geese grazing. These 80 acres were covered with sixty percent Carex, thirty percent cordgrass, and ten percent cattail-bulrush. A wild fire had previously burned over the area in March 1968 so that only one inch of litter and duff was available. Up to 55,000 wild geese and 100,000 ducks used the adjacent Long Slough but used the actual burn units very little during autumn before burning. Many white-tailed deer passed through the area and five loafed there. Meadow mice and other small rodents were common and attracted short-eared owls, marsh hawks, rough-legged hawks and coyotes. Bald eagles perched on the few small dead trees.

At 2:00 p.m. the temperature was 41°F, the soil wet, the relative humidity 61, the wind was blowing 13-18 mph out of the southwest. The fire danger was about twenty. We started the fire and obtained a good burn on all of the area except about 20 acres that had been irregularly grazed by cattle in 1967.

Blue geese, mallards, pintail and blue-winged teal used the burn adjacent to Long Slough during the spring migration. Cattle grazed the burn in early summer. But it was not possible to hold the herd on the site over summer, rank vegetation then covered the burn and kept the waterfowl out during their fall migration. Rodents and rapators also returned by December 1968. Cattle grazing will again be used in an attempt to prepare this area for fall waterfowl use in 1969.

Burn Unit 13b was inspected and prescribed burned to clean up the 1964 wild fire debris and to prepare the unit for goose browsing. Dead standing trees had been knocked down and Reed Canary grass and forbs had been encouraged as litter for a more complete burn. Live cottonwoods had been deliberately left scattered through the old burn. However, the cooperative farmer involved misunderstood and bulldozed these cottonwoods out when he should have been only building a fire line. About one inch of litter was on the damp ground. The temperature was 60°F, the relative humidity was 47 and the wind was 10 mph out of the southwest. A fair burn was obtained except on the green cottonwoods and the areas protected by new dirt were left practically untouched. White-tailed deer used the area prior to burning and continued to do so all year. The area will need another burn before it can be prepared for goose browsing.

F. Wild Fires

There were no wild fires reported in 1968. The CB&Q RR crews in October carefully burned a firebreak between the railroad and our west levee to prevent reoccurrences of previous wild fires from that quarters.

IV. RESOURCES MANAGEMENT

A. Grazing

Prescribed grazing for goose browse management was extended to about 1,000 acres of the central wet prairie in 1968.

Harold Trimmer grazed a total of 1,448 animal units from April 16 to December 1, 1968. Mr. Trimmer fed hay made on the refuge from about September 15 to December 1 in his grazing units. Difficulty in holding cattle on designated units after effective grass growth coupled with the resulting harrassment to waterfowl in the refuge interior from cattle herding and other activities resulted in our decision to prohibit livestock grazing later than October 1 in the future.

Don Morris also grazed about a total of 841 AUMs of cattle from April 25 to November 15, 1968 on two new grazing units. Under our supervision Mr. Morris's crew fenced out a 250 acre natural cordgrass area and constructed three miles of permanent fence and one mile of temporary electric fencing during the year. The refuge supplied the material for permanent fencing while the permittees supplied temporary fencing. Although all cattle were tested for Brucellosis before they were entered into the refuge some suspects turned up in the Morris herd. This necessitated separating the two herds from common fences and common water supplies and resulted in one grazing unit and some excellent potential goose areas not being grazed.

However, other units were grazed short and were quite attractive to all migrant geese and to some wintering Canadas.

During the late 1967-68 winter, ducks and geese both poured into the wet renovated G-2b pasture to clean up the remaining oats and grass roots. This unit was reseeded to Alsike, Reed Canary grass and Ladino clover during the spring. A crop of hay was removed during the early summer and then it was grazed by cattle. About 30,000 snow geese poured into the unit to compete with the cattle for clover in early October.

Later in the fall wild geese and some ducks loafed in the native grass pastures and did some feeding where standing waters made roots succulent.

Hundreds of Canada geese used the overgrazed G-4a unit as a loafing site through the colder December days.

Natural grasslands will also be discussed here for want of a better place. About 250 acres of Carex-Calamagrostis-Spartina wet prairie area was fenced out of grazing in 1968. This unit will be used as a control to measure changes brought about by the grazing and haying of the large wet prairie that had not been manipulated from 1935 to 1965.

This natural area will be designated with recognition signs. Educational institutes will be encouraged to use it for study purposes.

An isolated six acre grassland in the loess hills has also been set aside as a study area. This is that part of the Andler Recreation Tract that was in soybeans when the tract was purchased in 1966. We had the soybean land planted to winter wheat and then interseeded with 42 pounds of Aldous' little bluestem grass. Droughty conditions retarded the wheat but little bluestem did well and is again the dominent plant of this upland prairie. We hope to use this area as a source of upland prairie grass seed when needed.

B. Haying

Prescribed haying was also used in 1968 to increase waterfowl use of managed domestic browse. Fifty acres and 36.5 tons of alsike clover and mixed grasses were removed by special use permittees at $3.00 per ton. An additional 15 acres and 14 tons of bromegrass was removed from road shoulders at $2.00 per ton.

Wild geese made good use of the alsike areas during the fall and fed heavily on the bromegrass in December.

Another promising technique for improving habitat for waterfowl was developed in February when Special Use Permittee Harold Trimmer removed about eight tons of cattails from the East Bay of the Main Pool for livestock bedding. Waterfowl made some use of the mowed area in the spring although insufficient water was available to flood it. Cattails changed from first to fourth dominant plant in the 1968 regrowth. About ten tons of cattails were again removed from the East Bay in December 1968.

C. Fur Harvest

Maintenanceman Walter Boyd trapped one beaver and six muskrats during our early March control of nuisance mammals in levees. No share-trapping was accomplished in 1968.

V. FIELD INVESTIGATIONS

A. Progress Reports

1. Vegetation Surveys

Line intersect plant surveys were run across Bluff Pool, Northwest Pool, West Pool, Main Pool, the wet prairie and the fallow rice paddies. Most of this work was accomplished by Student John Hosking, a Humbolt College, Arcata, California, Senior. However, every Squaw Creek Refuge staff member as well as Area Biologist Dr. William Green helped John with these studies. Mr. Hosking's report on these studies was submitted to the Regional Office in September.

2. Wood Duck Studies

Post-nesting studies indicated that a wood duck brood was produced in a cypress box in the Southwest Pool and another brood may have been produced in the cluster of wood duck houses on Wood Duck Pond. A third wood duck brood was observed on the refuge but they may have hatched elsewhere.

Development of the once promising Wood Duck Pond proved disappointing in that the pond has not held water for two summers. New drains below the refuge indicate even less water storage at Wood Duck Pond and that it should be abandoned as a nesting area.

3. Teal Studies

Assistant Manager Siegfried carried out the blue-winged teal banding assignment.

Table 7. Pre-season blue-winged teal trapping 1968

Species	Adult Male	Adult Female	Immature Male	Immature Female	Total
Blue-winged teal banded	19	61	135	250	465
Blue-winged teal mortality	0	2	5	8	15
Total	19	63	140	258	480

Fifteen teal were killed by raccoon when due to a misunderstood change in assignments they were left in traps overnight. One of the raccoons was shot.

4. Cooperative Goose Management Studies

The 1967 Progress Report on Goose Management at Squaw Creek NWR was extracted from "A study of migration and mortality of geese in Missouri" Federal Aid Project #13-R-22, Work Plan 5, Job #1, by Richard Vaught, Missouri Department of Conservation (September 20, 1968) and made available to the prime cooperator on January 26, 1969. We have never found this approach satisfactory and this year's delay was the worst. For example, our report for 1967 and our recommendations for the 1968 autumn did not reach our administrators until sometime in February 1969! Fortunately much of the critical data had been reviewed in our 1967 Narrative Report (pp 29-33). The final report of this cooperative study should be completed as soon as all of the 1967 hunting season band recovery data is available - hopefully by July 1969.

Plans to informally carry this study on another year never fully materialized as State Waterfowl Biologist Richard Vaught became more and more involved with the total Missouri program and in more intense state studies at Swan Lake NWR.

Inventories

Only the January mid-winter waterfowl survey and seven out of possibly sixteen critical aerial waterfowl surveys of the Squaw Creek zone were made by the state waterfowl biologist in 1968. The refuge staff made weekly ground waterfowl surveys except during May-August when biweekly counts were sufficient in 1968.

All aerial counts were supplemented by the ground survey's waterfowl species and color composition data for the immediate vicinity.

Table 8. Peak fall goose numbers Squaw Creek NWR 1968

Date	Large	Small	White	Blue	Ross'	White-fronted	
11/4-10/68	5,000	2,000*	65,000	34,000	55	(10/14-21)	200*
11/18-24/68	5,500	190	129,000*	63,300*	200*		55
12/16-22/68	6,300*	300	60,000	30,000	90		2

* Peaks

Trapping

We were not able to trap any geese during the winter nor during the pre-hunting season period in 1968. We did trap 43 large Canadas during their October 20-November 18, 1968 Squaw Creek zone hunting season and 16 after their hunting season.

Table 9. Large Canada geese trapped at Squaw Creek NWR 1968

Time	Adult		Immature		1968	Percent
	Male	Female	Male	Female	Total	Immature
10/25-11/8	15	15	3	10	43	30
12/12/68	8	8	0	0	16	0
Total	23	23	3	10	59	22

The compilation of all (1956-65) indirect band recoveries for large Canada geese banded at Squaw Creek are shown in Table 10. We noted that 53% of these were recovered in Missouri with the Swan Lake zone recovering 30% and Squaw Creek zone only recovering 22%. Perhaps both the accelerated harvest and trapping programs at Swan Lake bias the recovery data.

Table 10. Location of indirect recoveries from Squaw Creek banded large Canada geese

Location	1956	1957	1958	1959	1960	1962	1963	1964	1965	Total	% of Total	Rank
Swan Lake	4	5	13	4	7	18	17	22	27	117	29.8	A
Squaw Creek	2	1	7	13	14	19	18	2	12	88	22.4	B
Other Missouri			1			2	1			4	1.0	C
Missouri	6	6	21	17	21	39	26	24	39	209	53.2	1
South Dakota	2	1		5	2	8	6	7	6	37	9.4	2
Manitoba	3	1	1	5	3	3	7	5	5	33	8.4	3
Iowa	1			4	1	3	4	2	7	22	5.6	4
Minnesota	1			1	1		6	3	6	18	4.6	5
Texas	1	1	2	1	3		1	2	1	12	3.1	6
Nebraska	2	2	1	3	1	1	1		1	12	3.1	6
Louisiana	3	2	3		2					10	2.5	7
N.W. Territories						1		5	3	9	2.2	8
North Dakota							1	2	5	8	2.0	9
Kansas	2		1					1	2	6	1.5	10
Wisconsin				1				3	1	5	1.3	11
Illinois	1						2		1	4	1.0	12
Saskatchewan				1		1	1		1	4	1.0	12
Arkansas		1						1		2	0.5	13
Mississippi					1					1	0.3	14
Ontario				1						1	0.3	14
Totals	22	14	29	39	35	56	65	55	78	393	100.0%	

Data for 1961 was deleted because only three indirect recoveries were obtained. The above data includes indirect recoveries from all bandings, whether pre-season, or post-season, experimental etc. Recoveries also include trapping records. The data is used to show the possible migration relationship with Swan Lake populations.

Band recovery data were analysed from 1,116 small type(s) Canada geese banded at Squaw Creek NWR from October 1, 1951 to December 31, 1967 in Table 11.

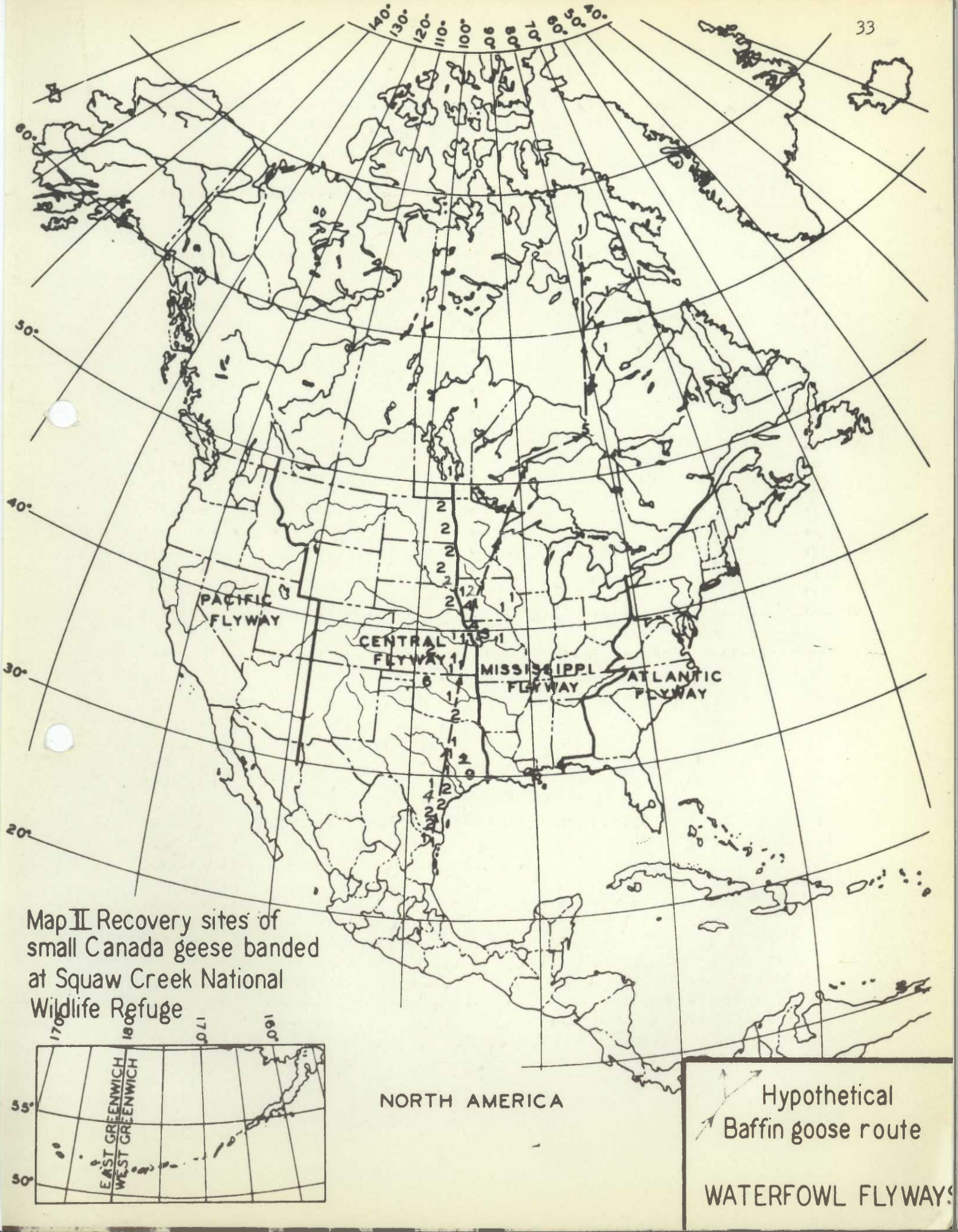
Table 11. Location of 158 recoveries from 1,116 small type(s) Canada geese banded at Squaw Creek NWR 10/1/51-12/31/68

Location	Number	% of Total	1st Year Direct	% of Total	Indirect	% of Total
Texas	53	33.5	7	13.2	46	43.8
Missouri	49	31.0	39	73.6	10	9.5
Oklahoma	10	6.3	1	1.9	9	8.6
Iowa	10	6.3	3	5.7	7	6.7
Kansas	7	4.4	3	5.7	4	3.8
South Dakota	6	3.7			6	5.7
Ontario	5	3.2			5	4.8
North Dakota	4	2.5			4	3.8
Manitoba	2	1.3			2	1.9
Nebraska	2	1.3			2	1.9
Quebec	2	1.3			2	1.9
Tamaulipas, Mexico	2	1.3			2	1.9
Baffin Is., N.W.T.	2	1.3			2	1.9
Illinois	1	.6			1	0.9
Minnesota	1	.6			1	0.9
South Carolina	1	.6			1	0.9
Utah	1	.6			1	0.9
Total	158	99.8%	53	100%	105	99.8%

Direct recovery data would suggest that Missouri is the principle recovery state for these geese, but indirect recoveries by removing banding site harvest bias show that Texas harvests are more critical for the small Canada geese populations than are Missouri's and Oklahoma's harvests.

Map 1. Recovery Sites of Small Canada Geese Banded at Squaw Creek NWR gives indications of the wintering, migration and nesting areas of the small Canadas that use Squaw Creek NWR.

It is apparent from these recoveries that we are dealing with two or more distinct populations. "Most recoveries have been made in a north-south route from Squaw Creek NWR. We assume that these small Canadas are "short-necks" or typical B.c. hutchinsii for which we have not yet received a nesting ground record. But we have received two nesting ground records from the Baffin Islands for the tiny light-breasted Canadas locally called "cackler". Two of these geese were also recovered in Tamaulipas, Mexico. A hypothetical route for these "cacklers" is shown on Map II."



Map II Recovery sites of small Canada geese banded at Squaw Creek National Wildlife Refuge

We trapped 157 blue and 456 snow geese during their October 20-December 28, 1969 Squaw Creek zone hunting season

Table 12. Blue geese trapped at Squaw Creek NWR 1968

Phase	Adult Male	Adult Female	Immature Male	Immature Female	Total	Percent Immature
Blue	56	46	35	20	157	35
White	99	106	149	111	465	56
Total	155	152	184	131	622	50

Again a bias toward immatures was indicated in trapping blue geese. Field studies indicated almost a disasterous nesting season with immatures varying by flock to flock from five percent to twenty-five percent. The trapping bias appeared to increase as the hunting season advanced and immatures became displaced from their family and original flocks. These young birds often form small leaderless gangs and/or attached themselves to a few crippled adults. These gangs did not leave the refuge to feed and often were attracted to a cannon net bait site for easy pickings. The ratio of blue to white phased trapped geese was about 25:75 in 1968. This ratio, however, may also be prejudiced by the time of trapping and by the stragglers involved.

The ratio of blue to white geese present on the refuge varies during migrations and are indicative of the source of the population. Generally those populations with a high blue ratio are from the Baffin Island Area while those with high white ratios are from colonies nesting west of Hudson Bay.

Many eastern blue geese apparently move north from Louisiana up the Mississippi and the Missouri Rivers and join the Hudson Bay geese at Squaw Creek Refuge and thus account for the high ratios of blues during the spring. The deep orange salt-fast stains on the heads of necks of these geese often indicate the gulf coast origin of these migration. Lack of this stain may indicate populations that do not winter on the coast.

Table 13. Ratio of blue to white geese observed at Squaw Creek NWR 1968

Date	Blue:White	Estimated Total Pop.	Remarks
2/29/68	35:65	60,000	Early migrants
3/5-7/68	57:43	45,300	Coastal stains
3/18/68	49:51	430,000	Main migration
10/1-6/68	23:77	110,000	Few young - early migrants
10/23/68	30:70	102,900	Normal flight
10/31/68	34:66	116,000	19% young
11/4/68	30:70	99,000	23% young
11/30/68	32:68	99,000	21% young
12/9/68	34:66	93,000	18% young
12/31/68	30:70	500	Stragglers

Hunting Kill

The 1968 waterfowl harvest was estimated by the ratios (factor) of previous total harvests to numbers picked by several selected commercial pickers during years when intensive harvest surveys were made.

Table 14. 1968 Waterfowl kill based on numbers processed

Kind	Processed	Factor	Harvest	Crippled	Total Kill	Peak Numbers	Percent Killed
Canada Geese	233	2.78	648	162	810	7,750	14.5
Snow and Blue	875	8.18	7,158	1,789	8,947	192,300	4.7
White-fronted	6	11.10	66	14	80	200	40.0
All Ducks	1,695	3.20	5,424	1,356	6,780	183,630	3.7

It appears that the decreased 1968 kills were due to poor waterfowl productivity which decreased numbers of young vulnerable waterfowl and except for lesser snow-blue geese decreased the total numbers of waterfowl available. Duck hunters participation was noticeably less than in 1967. Waterfowl hunting habitat was also in poorer condition than in 1967.

Only the white-fronted goose kill was considered excessive.

5. Cooperative Mammal Studies

Dr. Richard F. Myers and Refuge Manager Burgess drafted "Mammals of the Squaw Creek National Wildlife Refuge" early in the year. This checklist was based on several years of intensive study by Dr. Myers and his students while at both Central Missouri State College at Warrensburg and at the University of Missouri at Kansas City, with collaborations by other investigators and institutions. This leaflet, R.L. 327, was released from the Government Printing Office in June 1968 and is included in this report. It lists 34 mammals that have been observed on the refuge and 14 hypothetical species.

6. Mourning Dove Banding

Student Laborer John Hosking trapped 46 mourning doves between June 26 and August 31, 1968.

Table 15. Mourning doves banded at Squaw Creek NWR 1968

Adult		Immature			
Male	Female	Male	Female	Unknown	Total
11	5	9	0	21	46

7. Water and Habitat Management in Relation to Waterfowl Use
Wildlife Study R-3-1 Supplement #2

Squaw Creek Refuge started an evaluation of water management on goose use as the first phase of a proposed region-wide study. Our study outline was accepted October 21, 1968. The former rice paddies provided a series of impoundments which could be used in 1968 to test experimental designs and research techniques for measuring moist soil plant yields and waterfowl use.

Basic plant surveys were made by Student Laborer Hosking, Area Biologist Green and Refuge Managers Burgess and Siegfried. Vegetation sampling surveys were planned by Dr. Cowardin, Northern Prairie Research Center, Regional Biologist Dill and Area Biologist Cummings. Exclosures and control areas were laid out by Siegfried and Walter Boyd. Waterfowl use observations were made by Siegfried and Biologist Ed Zoch.

Mr. Zoch was on an assignment here from November 1 to December 15, 1968 to complete the observations and to write the 1968 progress report.

Due to his draft Mr. Zoch's assignment was prematurely terminated. He was also harassed by a virus during his final report writing week which resulted in a pencilled copy, only, being forwarded to the regional biologist without benefit of refuge editing and typing. The copy was typed in the regional office as "Water and Habitat Management in Relation to Waterfowl Use" Edward Zoch, Bureau of Sport Fisheries and Wildlife, Squaw Creek National Wildlife Refuge, Mound City, Missouri (pp 23 1968). We edited this report on December 18, 1968 and prepared a two page memorandum of comments and corrections. I believe that the report should be revised accordingly.

Mr. Zoch actually did a marvelous job of observing and reporting. We differ mainly in our interpretations based on many years of experience with marshes, geese and farming.

Mr. Zoch's revised abstract follows: This study was conducted on the Squaw Creek National Wildlife Refuge in November, 1968 to obtain quantitative data on waterfowl use of managed moist soil plant units. Behavior of blue geese (Chen caerulenscens) and Canada geese (Branta canadensis) was observed on two flooded and two dry study plots. Ninety-one percent of all use occurred on wet areas. Canada geese numbers were relatively small and they fed proportionately little on the study area. Use of water for drinking appeared important. Food plots .000136 acre in size were placed in the study area as control and experimental plots, recovered and processed. Vegetation was weighed in an attempt to obtain a quantitative measure of waterfowl use of moist soil food plants. Design problems were evaluated and solutions submitted. There is evidence that managed marshes can produce equivalent amounts of food per acre to agricultural crops at a fraction of the cost.

VI. PUBLIC RELATIONS

A. Recreation Use

The public used Squaw Creek National Wildlife Refuge about 21,000 times in 1968. This is considerably less than was estimated for 1967 when higher waters and better fishing were summer attractions. The primary purpose of the 1968 visits were wildlife observation and tours (See Form 3-123 Yearly Public Use Report).

For the first time since the refuge was established, a large portion of the refuges perimeter roads were kept open (with some misgivings) as a self-guiding wildlife senic vehicle tour route during the waterfowl hunting season. In general we thought that the response by both waterfowl and visitors were good. We did receive some complaint from refuge boundary hunters that the tourists were moving the waterfowl away from them. To prevent a direct confrontation we only allowed the visitors to use the perimeter roads from 10:00 a.m. to 5:00 p.m. on weekends.

There has previously been considerable agitation to permit periphery hunting at Squaw Creek National Wildlife Refuge. It appears to us that we can permit a hundred times as much sightseeing as we could hunting on the perimeter without completely compromising our primary objectives.

We collected Land and Water Conservation fees from April 1 to December 1, 1968 and thus included most of the attractive seasons for visitors. The total collection was $1,695.00. We probably spent that much or more in regular, weekend, compensatory and overtime administering the program but it was received by the public in 1968 the best of any year.

B. Official Visitors

Name	Affiliation	Purpose	Date
G. McCloud	Mo. Cons. Agent	Enforcement	1/9
J. Clifton*	Mo. Cons. Agent	Enforcement	1/9
S. Kramer	Mo. Cons. Agent	Enforcement	1/12
T. Pfaff	Mo. Hy. Patrol	Courtesy	1/15
V. Maiben*	O.E.O.	Counsel YOC	1/15
S. Reeves*	O.E.O.	Counsel YOC	1/15
H. Trimmer*	Maitland, Missouri	Haying	1/16
L. Logan*	NWMS College	Birding	1/18
S. Mitchell	NWMS College	Birding	1/18
Dr. Minter*	NWMS College	Birding	1/18
M. Todd*	NWMS College	Birding	1/18
C. Huffman*	Mound City, Missouri	Trapping	1/20
J. Hague*	USGMA, St. Joseph	Enforcement	1/20
P. Rice*	MCDA, St. Joseph	Enforcement	1/20
D. Norman	Mo. Cons. Dept.	Orientation	1/24
C. Srupper	Mo. Cons. Dept.	Orientation	1/24
R. Faiauer	Mo. Cons. Dept.	Orientation	1/24
H. Crawford*	Mo. Cons. Dept.	Cons. Education	1/24
E. Cockran	O.E.O.	Counsel YOC	1/24
F. Diggs*	Hamburg, Iowa	Net birds	1/26
J. Hamilton*	St. Joseph Audubon	Bird Watching	1/28
H. Sprague*	St. Joseph Audubon	Bird Watching	1/28
V. Broyles	USGMA, Kansas	Age-Sex Waterfowl	1/30
F. Kish	Topeka Zoo	Age-Sex Waterfowl	1/30
R. Hill	Maryville, Missouri	Seed Corn	2/2
W. Atkins	Forest City, Missouri	Cargill, Inc.	2/2
E. Gibson*	Forest City, Missouri	Hay	2/2
R. Andler*	Forest City, Missouri	Hay	2/2
R. Rowlett	NWMS College	Birding	2/3
R. Brown*	St. Joseph Audubon	Birding	2/4
S. Rositzky*	St. Joseph Audubon	Birding	2/4
W. Zientorski	Kansas City, Missouri	Photography	2/6
R. Myers*	Dept. Biol. UMKC	Birding	2/17

Name	Affiliation	Purpose	Date
F. Bart*	Burroughs Nature Club	Birding	2/18
H. Gregory*	Independence, Missouri	Birding	2/18
T. Vest	MC R-II School	Observation	2/18
D. Sutherland	BSFW, Wash.,D.C.	Miss. Flyway	2/21
H. Dykema	MCD, St. Chas., Mich	Section Tour	2/21
R. Chabreck	LSU, Baton Rouge, La.	" "	2/21
A. Hawkins	BSFW, Minneapolis	" "	2/21
G. Brakhage	BSFW, Minneapolis	" "	2/21
M. Burch*	MCD, Schell City, Mo.	" "	2/21
H. Dill*	BSFW, Minneapolis	" "	2/21
S. Lewis	MCD, Montrose, Missouri	" "	2/21
L. Strong	Miss. G&F Comm.	" "	2/21
J. Burrow	MCD, Schell City, Mo.	" "	2/21
B. Lilly	Miss. G&F Comm.	" "	2/21
H. Miller	BSFW, NPWRC	" "	2/21
G. Hunt	U of Mich., Ann Arbor	" "	2/21
J. Thompson	Iowa State Univ.	" "	2/21
W. Gale	Iowa State Univ.	" "	2/21
W. Sanders*	BSFW, Jeff. City, Mo.	" "	2/21
R. Jessen	St. Paul, Minn.	" "	2/21
G. Kemader	S. Whitley, Ind.	" "	2/21
R. Andrews	BSFW, Laurel, Md.	" "	2/21
W. Reed	MCD, Salem, Missouri	" "	2/21
K. Slagle	MCD, Columbia, Missouri	" "	2/21
G. Berger	McGraw Foundation, Ill.	" "	2/21
F. Bellrose	Ill. NHS	" "	2/21
T. Joanen	La. WLF	" "	2/21
K. Babcock	Miss. G&F	" "	2/21
D. Witt	Mont. G&F	" "	2/21
R. Buller	BSFW, Albuquerque, N.W.	" "	2/21
D. Kerbes	CWS, Ottawa	" "	2/21
D. Raveling	CWS, Winnepeg	" "	2/21
W. Beshears,Jr.	Ala. Dept. Cons.	" "	2/21
R. Bishop	Iowa Cons. Comm.	" "	2/21
D. Vaught*	MCD, Columbia, Missouri	" "	2/21
J. Mathiesen	US Forest Service	" "	2/21
C. Barstow	Tenn. G&F	" "	2/21
R. Smith	TVA, Golden Pond, Ky.	" "	2/21
J. Gore	Tenn. G&F	" "	2/21
R. Hanson	BSFW, Minneapolis	" "	2/21
S. Wilson	Crop. of Engineers	" "	2/21
G. Schildman	Game & Park Comm.	" "	2/21
W. Hamer	SCS	" "	2/21
L. Kline*	BSFW, Swan Lake NWR	" "	2/21
R. Timmerman*	BSFW, Swan Lake NWR	" "	2/21
D. Kennedy	Ill. Dept. Cons.	" "	2/21

Name	Affiliation	Purpose	Date
Bill Miller	CWS, Ottawa	Miss. Flyway	2/21
C. Hoffpauer	La. W&F	Section Tour	2/21
J. Lynch	BSFW, Louisiana	" "	2/21
H. Hansen	BSFW, Washington, D.C.	" "	2/21
H. Lumsden	Ontario, Canada	" "	2/21
G. Bossenmaier	Manitoba Wildlife Branch	" "	2/21
E. Mikula	Mich. Cons. Dept.	" "	2/21
E. Podell	Soil Cons. Serv., N.D.	" "	2/21
K. Martinson	BSFW, Laurel, Md.	" "	2/21
J. Burbank	TVA, Kentucky	" "	2/21
J. March	Wisc. Cons. Dept.	" "	2/21
R. Hunt	Wisc. Cons. Dept.	" "	2/21
P. Smith	BSFW, Atlanta, Ga.	" "	2/21
G. Arthur	Ill. Cons. Dept.	" "	2/21
A. Geis	BSFW, Laurel, Md.	" "	2/21
B. Leitch	DU of Canada	" "	2/21
L. Jahn	Wildlife Mgmt. Inst.	" "	2/21
G. Brakhage	BSFW, Minneapolis	" "	2/21
B. Barratt	Iowa Cons. Comm.	" "	2/21
J. Hale	Wisc. Cons. Div.	" "	2/21
D. Hankla	BSFW, Georgia	" "	2/21
R. Holmes	Minn. Cons. Dept.	" "	2/21
K. Bednarik	Ohio Div. Wildlife	" "	2/21
B. Crawford*	Mo. Cons. Comm.	" "	2/21
J. Martz	Mich. Dept. Cons.	" "	2/21
W. Newcome	USGMA, Des Moines, Ia.	Courtesy	2/23
D. Smith*	Univ. Mo. at K.C.	Field Study	2/24
W. Shoemake	Maryland Hgts., Mo.	Take Movies	2/24
F. Lawhon*	St. Joseph Audubon	Birding	2/25
B. Rountee	SCS	Sightseeing	2/27
M. Hamilton	Soil Cons. Service	Sightseeing	2/27
B. Moran	Soil Cons. Service	Sightseeing	2/27
C. Long	Soil Cons. Service	Sightseeing	2/27
H. Yount*	Mound City, Missouri	Cooperative Farming	2/27
B. Herndon*	MSHD, St. Joseph, Mo.	Sightseeing	2/28
J. Wortham	MSHD, St. Joseph, Mo.	Sightseeing	2/28
W. Lonnecker	Davenport, Iowa	Photography	3/9
R. Henry	SW Bell Tel. Co.	Maintenance	3/11
W. Gahm	Mound City, Missouri	Brought sparrow hawk	3/11
J. Agee*	Boy Scout Office	Discuss Scouting	3/15
D. Parmelee	KSTC, Emporia, Kansas	Field Trip	3/16
D. Trauger*	Ames, Iowa	Visit	3/16
B. Heins	US Public Health	Sightseeing	3/16
E. Helms	US Public Health	Sightseeing	3/16
J. Shandling	US Public Health	Sightseeing	3/16
R. Foster	Maryville, Missouri	Photography	3/16

Name	Affiliation	Purpose	Date
L. Burgess*	Columbia, Missouri	Visit	3/16
W. Tenney*	Mound City, Missouri	Cooperative Farming	3/18
Dr. Landis	Appleton, Wisc.	Photography	3/15-24
M. Ater	Rock Port, Missouri	News Story	3/24
R. Gillip	Boy Scout Office	Scouting	3/28
J. Beechner	SW Bell Tel. Co.	Maintenance	3/28
P. Garrett	SW Bell Tel. Co.	Maintenance	3/28
R. Nolf*	St. Joseph Museum	Birding	3/30
W. Robbins	Independence, Mo.	Photography	3/31
C. Garrett	Kansas City, Kans.	Photography	3/31
M. Bredehoft	Independence, Mo.	Photography	3/31
H. Simpson	Kansas City, Mo.	Photography	3/31
E. Skinner	Challenger Camera Club	Photography	3/31
D. Reynolds*	St. Joseph News Press	Sightseeing	3/31
P. Ticknor*	Mo. Cons. Dept.	Sightseeing	3/31
G. Raines*	Crouch Truck Line	Delivery	3/31
P. Andrews*	Columbia, Missouri	Insect Study	3/31
D. Easterla*	NWMSC, Maryville, Mo.	Birding	4/7
J. Steward*	U of Mo. at K.C.	Study	4/13
L. Goodnight	U of Mo. at K.C.	Plant Collecting	4/17
C. McCormack	Mound City, Missouri	Discuss I-29	4/23
W. Ideker	Mound City, Missouri	Discuss I-29	4/23
B. Childers	Mound City, Missouri	Discuss I-29	4/23
H. Keasler	Columbia, Missouri	Collecting Insects	4/27
D. Morris*	Fortescue, Missouri	Grazing	4/27
E. Cole*	Mo. Audubon Society	Field Trip	5/19
C. Harrison	St. Joseph, Missouri	Bid Forms	5/27
D. Robertson*	NWMSC Instructor	Sightseeing	6/1
J. Cline	Cline Const. Co.	Bid Forms	6/4
A. Matthews	Big Lake	Bid Forms	6/4
R. Siegfried	Eagle River, Wisc.	Employment	6/11
Rev. Clements	Maryville, Missouri	Bird Watching	6/15
W. Howe	Mo. Geol. Survey	Visit	6/20
K. Anderson	Chief Geologist MSHD	Visit	6/20
J. Thacker	Geologist, MSHD	Visit	6/20
J. Worthon	Geologist, MSHD	Visit	6/20
T. Thurnau	OEO, Counselor	Visit	6/27
J. Newton*	Newton Const. Co.	Bid Information	7/1
D. Edwards*	Mound City, Missouri	Cooperative Farming	7/6
J. Rhoades	Savannah, Missouri	Info. on radio geese	7/6
N. Andler	Forest City, Missouri	Hay	7/13
D. McClain	Fishery Services	Fish Sampling	7/16
K. Butts	Fishery Services	Fish Sampling	7/16
C. Caton*	Mound City, Missouri	Drainage District	7/31
W. Green*	BSFW, Winona, Minn.	Plant Transect	8/1
D. Dougherty*	Kansas City, Missouri	Study bird life	8/6
G. Jones*	Mound City, Missouri	Bird study	8/17
L. Linville	Skidmore, Missouri	Birding	9/8

Name	Affiliation	Purpose	Date
Rev. Deeds	Maitland, Missouri	Trail Ride	9/12
R. Rudale	St. Joseph, Missouri	Drainage District	9/13
C. Poage	St. Joseph, Missouri	Drainage District	9/13
B. Evans	MCD	Courtesy	9/16
H. Watkins	Mo. Highway Dept.	Conference	10/2
K. Townley*	Mo. Highway Dept.	Conference	10/2
E. Bartel*	Mo. Highway Dept.	Conference	10/2
C. Dew	Mo. Highway Dept.	Conference	10/2
J. Richey*	BSFW, Engineer Div.	Conference	10/2
P. Morgan*	BSFW, Refuge Div.	Conference	10/2
D. Meyer*	Drainage Dist. #2	Conference	10/2
C. Caton*	Drainage Dist. #2	Conference	10/2
H. Duncan	Drainage Dist. #2	Conference	10/2
E. Wright	Drainage Dist. #2	Conference	10/2
E.E. Richards*	Attorney D.D.#2	Conference	10/2
J. Fitzgerald*	Mo. Highway Dept.	Highways	10/2
K. Vogt	SCS	Geol. Meeting	10/5
J. Welks	SCS, Rolla, Mo.	Geol. Meeting	10/5
W. Gillis	OEO, Mound City, Mo.	Head Start	10/8
R.D. Andrews*	Iowa Cons.	Visit	10/11
P. Prevett*	Ontario, Canada	Study Geese	10/31
J. Gowing*	KMA, Shenandoah, Ia.	Radio Program	11/1
B. Thomas	Mound City, Missouri	Loess Foundation	11/23
C. Simmons*	Mo. Highway Dept.	Visit	11/24
H. Gunderson*	Lincoln, Nebr.	Photography	11/27
S. Clark*	St. Joseph News Press	News Story	11/30
T. Follrath	R.O., Minneapolis	Housing	12/2
B. Hermesch	Seneca, Kansas	Bid Information	12/9
W. Ideker	Mound City, Missouri	Bid Information	12/9
D. Peterson	Branson, Missouri	Photography	12/10
F. Clark,Jr.	Mich. Wisc. PipeLine	Aircraft Violation	12/10
R. Long	Mound City, Missouri	Bid Information	12/11
B. Ballou	Washington, D.C.	Marsh Study	12/18

Frequent visitors have been marked with an asterisk (*).

C. Refuge Participation

All Squaw Creek National Wildlife Refuge personnel were active with public relations in 1968. They received guests and conducted tours as the need arose.

The refuge released eighteen issues of "Squaw Creek Digest", a periodically issued column that could be used as a news release or as written and made available to thirty-three news media during the year.

An article, "Safe Conduct for the Blues and Snows", featuring cooperation between Squaw Creek National Wildlife Refuge, U.S. Game Management Agents and Missouri, Nebraska and Iowa Conservation Agents in shepherding geese on their spring migration appeared in the April 1968 Friends (Chevrolet's trade magazine).

Refuge Manager Burgess continued to serve on the Mississippi Flyway Technical Section's Blue-snow-white-fronted goose committee participating in the Flyway "workshops" at St. Joseph, Missouri and Traverse City, Michigan. The staff were hosts to an afternoon tour of Squaw Creek National Wildlife Refuge by participants in the St. Joseph workshop on February 21. Additional public participations by members of the Squaw Creek staff are listed:

Participation 1968

1/1 Burgess compiled, edited and submitted 1967 Christmas Bird Count.
1/2 Burgess on Annual Leave conferred with Manager Stemmerman, Flint Hills NWR and State Regional Game Manager Hager, Burlington, Ks.
1/3 Burgess on A.L. conferred with Dr. Parmalee, Emporia State College, Emporia, Ks. about Arctic geese.
1/4 Burgess on A.L. conferred with State Waterfowl Biologist Schwilling at Great Bend, Ks. and toured Cheyenne Bottoms and Quivera National Wildlife Refuge.
1/5 Burgess on A.L. accompanied by Schwilling visited Kansas Forestry, Fish and Game Commission Headquarters at Pratt and Salt Plains NWR, Jet, Oklahoma and returned to Great Bend, Ks.
1/8 Burgess and Yocum made coordinated ground-aerial mid-winter waterfowl survey of Holt County.
1/8 Burgess and Yocum showed slides, discussed refuge purpose and ecological relationships for 25 members of NWMSC Animal Ecology Class and conducted tour of refuge.
1/25 Burgess discussed refuge objectives and goose taxonomy for Supervisor Rice and six Missouri Department of Conservation trainees.
2/8 Burgess gave illustrated talk on conservation to Forest City,
2/8 Missouri Garden Club.
2/10 Andrews conducted Santa Fe High School, Olathe, Ks. biology class on walking and bus tour of refuge. Burgess discussed refuge's purpose and operations.
2/13 Burgess made tape recording for KMA Radio, Shenandoah, Iowa
2/17 Andrews conducted 30 six-sixteen year old members of Kansas City Science Club on walking and bus tour of refuge. Burgess explained refuge's purpose and operations to 20 MU at KC biology students.
2/19-23 Burgess, Andrews and Yocum participated in Miss. Flyway Technical Section Workshop. All staff members assisted with the workshop's tour of refuge.
2/25 Burgess discussed refuge's purpose with 20 members Ivandale School Science Club.

3/3 Burgess briefed U. of Kansas Faculty Wives on purpose of refuge.

3/7 Burgess conducted Mr. and Mrs. Dean Cole and Mrs. Millman on tour of areas available to Nature Conservancy.

3/9 Burgess briefed Kansas Junior Academy of Science members on purpose of refuge.

3/10 Burgess briefed 15 ornithology students, NWMSC, on refuge purpose and pointed out saw-whet owl.

3/15 Burgess conducted photographers Dr. and Mrs. Ralph Landis, Appleton, Wisc. on tour of refuge photographic sites.

3/16 Yocum and Huffman supervised overnight camping and conducted tours for K.C. Boy Scouts and Higginsville, Mo. School Ecology Club. Burgess briefed members of Emporia Kansas State College ornighology class and ISU, Ames, Iowa zoology club members on refuge purpose and chaired Trauger's presentation of Perry River North for all three groups.

3/17 Burgess briefed members of Higginsville School, K.C. Boy Scout Troop, U of M at K.C. and Central Mo. State College Ecology Classes on the purpose of the refuge.

3/18-19 Burgess and Yocum coordinated survey of white-fronted geese in Holt County, Missouri with Central Flyway surveys.

3/18 Burgess and Yocum briefed members of Cub Scout Pack 71 and Brownie Girl Scouts of Mound City on refuge purpose.

3/19 Burgess and Dr. Richard Myers, MUKC, co-edited "Mammals of Squaw Creek NWR"

3/20 Burgess attended Iowa wildlife area manager meeting at Forney Lake headquarters.

3/21 Burgess and Hamilton conveyed Iowa Area Managers from Fairfax, Mo. on inspection of refuge's marsh management and headquarters.

3/21 Burgess conducted Stanberry High School members on tour of refuge and during evening gave illustrated talk on refuge to Holt County Democratic Club.

3/23 Burgess briefed Faucett High School members on refuge purpose. Huffman led loess hill nature hike and refuge tour.

3/25 Burgess gave father's response at annual Father-Daughter Girl Scout Banquet, Maitland, Missouri.

3/25 Burgess introduced speaker Phil Rice, MDC, at Twentieth Century Women's Club meeting at refuge office.

3/31 Burgess and Huffman briefed 120 members of St. Joseph Audubon Club sponsored bus tours and other visitors on refuge purpose.

4/2-4 Burgess conferred with Dick Vaught MCD on cooperative goose management studies.

4/5-6 The Burgess family hosted the Maitland-Mound City Senior Girl Scouts on overnight campout, hikes and motor tour of refuge.

4/7 Burgess conducted Dr. and Mrs. Roger Tory Peterson and followers from St. Joseph and Maryville Audubon Clubs on birding tour of refuge.

4/9 Mrs. Zeliff received and Mr. Yocum conducted members of Maitland Public School and Albany High School Biology Classes on tours of refuge.

4/15 Mrs. Zeliff received and Manager Burgess conducted 30 Craig High School Social Studies students on tour of refuge and explained purpose.

4/19 Mrs. Zeliff received and Manager Burgess conducted 40 members South Holt School sixth graders and two members of Federally sponsored Project Communicate on tour of refuge and explained purpose.

4/23 Burgess participated in a conference between State Rep. Cox, Banker McCormack and Contractor Ideker of Mound City and Missouri Highway Dept. District Engineer Townley about proposed US 159.

4/27 Burgess gave illustrated talk about refuge to 40 Boy Scout Junior and Adult leaders at St. Joseph, Missouri.

5/1 Burgess briefed 35 Rosendale High School biology students on refuge purpose. Yocum conducted students on tour of refuge. Burgess talked about Bureau and Squaw Creek Refuge history, purpose and operations to 20 Rock Port, Mo. High School "Contemporary Living" seniors and conducted group on tours.

5/3 The Manager, Mrs. Zeliff, Messrs. Yocum and Hamilton received, described refuge and conducted on tours 35 Parnell, Mo. sixth graders, 100 Savannah, Mo. fourth graders and 20 Missouri Western College biology students.

5/10 Mrs. Zeliff and Messrs. Yocum and Hamilton received and conducted 150 Ravenwood High School students on tours of refuge and headquarters area.

5/11 Mrs. Zeliff received 12 members of Faith Baptist Church, Olathe, Ks. Sunday School and described refuge.

5/18 Mrs. Zeliff, Messrs. Burgess and Huffman received and discussed refuge purpose and operations and otherwise hosted 40 members Missouri Audubon Club and members of MUKC ornithology class and Roseville, Kansas Biology Club.

5/19 Burgess, Zeliff and Huffman received and discussed refuge operations with about 50 members of Missouri Audubon Society and other visitors.

5/21 Burgess spoke at Tri-State Conservation Agents Conference at Big Lake State Park.

5/22 Burgess conferred with Refuge Managers Timmerman and Kline and State Waterfowl Biologist Vaught at Swan Lake NWR.

5/26 Burgess explained refuge operations to 60 members Porsch Car Club of America.

5/31-6/2 Burgess supervised camp set-up and service project for 20 members BSA Troop 219, Amazonia, Missouri.

6/12 Burgess and Hosking were guests of Mound City Kiwanis.

6/14 Hosking and W. Boyd showed "Portugal With Pleasure" to RLDS Father and Son Banquet.

6/19 Burgess and Hosking helped Missouri personnel round up and band resident giant Canada geese at Trimble Wildlife Management Area.

6/28	Burgess conducted 35 Horace Mann Public School students and teachers on tour of refuge.
7/3	Burgess and Siegfried were guests at Mound City Kiwanis.
7/8	Zeliff, Burgess and Hosking received and explained refuge purpose and activities and conducted 47 members of the Kansas City Fifth Annual Science Camp on nature hike and bus tour.
7/9	Zeliff and Burgess received Craig, Missouri Headstart children and conducted them on nature hike.
7/14-17	Mr. Burgess (on leave) and Mrs. Burgess conducted Maitland-Mound City Senior Girl Scouts on camping heritage tour of Wakonda State Park, Quincy-Hannibal area.
7/20-8/3	Siegfried took two weeks Reserve Air Force training at Richard-Gabeur Air Force Base, Grandview, Missouri.
7/23	Burgess, Hosking and Zeliff received, explained refuge purpose and conducted 30 members Kansas City Science Camp on nature hike and bus tour.
7/25	Burgess discussed refuge objectives and conducted 37 NWMSC Conservation and Biology students on tour of refuge.
8/5	Yocum presented illustrated program for Graham, Missouri Lions Club.
8/3-7	Burgess participated in Mississippi Flyway Technical Section Workshop at Traverse City, Michigan.
8/6	Zeliff, Yocum and Siegfried received and conducted 30 Kansas City Science Camp members on nature and bus tours.
8/25-30	Assistant Manager Siegfried and Operator Hamilton attended the Conservation Law Enforcement Training at Madison, Wisc.
9/3	The entire staff attended the Regional Safety Officer's course on defensive driving.
9/26	Burgess talked on regulations and Dr. Green explained duties of an Area Biologist to Oregon, Mo. Kiwanis Club.
9/3	Hosking conducted members of Oregon Garden Club on car tour of the refuge.
9/8	Burgess and Siegfried received and birded with members of the Kansas City Burrough's Club.
9/20	Burgess explained refuge objectives and directed car tour of waterfowl area for the Bedford, Iowa Women's Club.
9/22	Burgess and Grazing Permittee Trimmer supervised 40 members of Nodaway Valley Saddle Club on trail ride in GU-2. Burgess explained refuge purpose.
9/28	Burgess and Siegfried gave refuge slide shows for Boy Scout Troop 75, Maryville (housed in Mound City gym) and to RLDS Church supper.
10/2	Burgess and various staff members with Messrs. Morgan and Richey (Minneapolis R.O.) conferred with representatives of Newton Bridge Co., Missouri Highway Department and Holt County Drainage District #2.

10/3 Burgess and various staff members conferred with Assist. Supvr. Morgan, Regional Biologist Dill, Area Biologist Green and Cummings and Refuge Managers Timmerman and Kline about proposed Canada goose-marsh evaluation study.

10/4 Burgess and Dr. Green prepared second revision of goose-marsh study outline.

10/5 Burgess gave illustrated talk and conducted 60 members of Association of Missouri Geologists on tours of refuge.

10/6 Burgess and Zeliff received and conducted 50 Harrison County 4-Hers on tour of refuge.

10/10 Burgess gave 7:00 a.m. talk to Maryville Optimist Club.

10/10-11 Burgess, Cummings and Dr. Cowardin NPWRC examined goose-marsh study area and revised study outline.

10/11 Burgess gave illustrated talk to Beta Beta Beta Convention at NWMSC, Maryville.

10/12 Burgess and Zeliff received and conducted 50 members of Beta Beta Beta National Science Fraternity on tour of refuge.

10/13 Burgess and Zeliff received 115 tourists from three bus tours sponsored by St. Joseph Audubon Society.

10/15 Burgess conducted tours for 50 Horace Mann 5th and 6th grade students and ten Tarkio College General Ecology students.

10/18 Burgess conducted 110 Avenue City School children on tour of refuge.

10/19 Burgess and Zeliff received, conducted tours and explained refuge's purpose for 16 MUKC Animal Ecology students, 30 Shawnee Mission Kansas High School zoology students and 30 Troop 216 Boy Scouts.

10/27 Refuge exhibited at "Home of the Honkers" Art Fair.

11/5 Burgess cut three tapes and Paul Prevett, U of Western Ontario, cut one tape on snow geese and other subjects for Radio KMA, Shenandoah, Iowa.

11/7 Siegfried conducted Skidmore Cub Scouts and leaders on tour of loess mounds and waterfowl areas.

12/21 Burgess coordinated Christmas Bird Count of Squaw Creek area and compiled data.

D. Hunting

Hunting was not permitted on the Squaw Creek National Wildlife Refuge. We were concerned with the hunting in the Squaw Creek area that influences wildlife use of the refuge. In recent years we have been particularly concerned with an over-harvest of Canada geese in this vicinity. Some progress has been made toward correcting this situation with restrictive regulations and special refuge management since 1964.

The 1968 Squaw Creek area hunters were offered a 70 day goose season starting October 20th with an aggregate bag of five geese. The Canada goose season was restricted to 30 days and one daily. White-fronted geese could unjustifiably still be hunted 70 days with two bagged daily.

The duck hunting season was November 1-30, 1968 in Missouri. The daily legal duck bag was three of which only one could be a mallard.

The estimated 1968 waterfowl hunting kill in this vicinity was 810 Canada geese, 8,947 snow-blue geese, 80 white-fronted geese and 6,780 ducks. (See Table 14. page for waterfowl harvest details.)

E. Violations

Three refuge staff members had enforcement credentials. Refuge operations keep us occupied too much of the time to give waterfowl hunting violations in this vicinity the attention needed. Both U.S. Game Management Agents Hague and Sanders worked the area when possible. The Missouri Department Agents also responded well to law enforcement challenges in this area under Supervisor Phil Rice.

Agents Hague, Rice and Ticknor did some excellent public relations work on TV explaining the hunting regulations and showing and describing some of the white birds (swans, pelicans etc.) that were not legal game birds.

No cases were refused by the County Attorney in 1968 but an unusual number were fought in magistrate court and one was appealed to circuit court and is still pending. We did not bother our lame duck U.S. Attorneys as they previously had indicated that they weren't interested in anything less than a bank robbery.

An interesting case resulted from the Assistant Manager and Missouri Agent Clifton apprehending a small time market hunter with over the daily bag limit of Canada geese. His fine and court costs were small. But after his conviction his old buddies stopped hunting with him and the land owner told him not to come back. Undoubtedly all of these people knew that he was violating previously and perhaps that was why they were involved but they didn't like a loser.

The following cases reported as pending Federal Court action at the end of 1967 were processed in 1968.

Name	Violation	Action
Robert Brenan Topeka, Kansas	Possessing whistling swan	Fined $25.00
Marshall Bliss Shawnee, Mission, Ks.	Bagged six teal	U.S. Attorney refused prosecution
Stanley Allen St. Joseph, Missouri	Killed baldpate in teal season	U.S. Attorney refused prosecution
Edward Haren, Jr. Shawnee Mission, Ks.	Possessing whistling swan	U.S. Attorney refused prosecution

The following 1968 cases were processed by Magistrate Judge John Bowes, Oregon, Missouri:

Date	Name/Address	Violation	Agent	Action
11/11	Wm. E. Graff Mound City, Mo.	Take overlimit Canada geese	Siegfried & Clifton	$ 5.00 fine 12.00 costs
11/18	Jerry Rowlett Mound City, Mo.	Attempt to take ducks after hours	Burgess & Siegfried	$10.00 fine 12.00 costs
11/18	Richard D. Gilland Mound City, Mo.	Attempt to take ducks after hours	Burgess & Siegfried	$10.00 fine 12.00 costs
11/18	Carl A. Rapp Olathe, Kansas	Attempt to take ducks after hours	Siegfried & Burgess	$10.00 fine 12.00 costs
11/19	Edward J. Epson Omaha, Nebraska	Take two mallards	Siegfried	$ 5.00 fine 12.00 costs
11/19	Richard Degiacomo Omaha, Nebraska	Take three mallards	Siegfried	$ 5.00 fine 12.00 costs
11/23	Finas Chapin St. Joseph, Mo. (Appeal to Circuit	Attempt to take Canada goose in closed season Court pending)	Burgess	$ 5.00 fine 12.00 costs
11/23	Robert Douglas St. Joseph, Mo. (Appeal to Circuit	Attempt to take Canada goose in closed season Court pending)	Burgess	$ 5.00 fine 12.00 costs
11/23	James L. Haynes St. Joseph, Mo.	Refuge trespass*	Burgess	$ 5.00 fine 10.00 costs
11/23	Norton G. Rollett St. Joseph, Mo.	Refuge trespass*	Burgess	$ 5.00 fine 10.00 costs
11/28	Roger Whetsell St. Joseph, Mo.	Attempt to take duck after hours	Burgess	$ 5.00 fine 12.00 costs
11/28	Richard A. Garbowski St. Joseph, Missouri	Attempt to take duck after hours	Burgess	$ 5.00 fine 12.00 costs
12/1	Junior Campbell St. Joseph, Mo.	Refuge trespass*	Burgess	$ 5.00 fine 12.00 costs
12/1	Neil Fanning St. Joseph, Mo.	Refuge trespass*	Burgess	Found Not Guilty

* Refuge trespass in these cases consisted of shooting over the refuge boundary fence and were all contested.

F. Safety

Our accident prevention record reached 397 days without a lost time accident by December 31, 1968.

Safety meetings were held periodically during the year with the chairmanship rotating among the staff. New employees were oriented on safety policy and operations as they entered on duty.

Several anti-roll bars and seat belts were installed on refuge tractors. Banisters and other guards were built near bridges and other water structures.

A one day defensive driving school was conducted for all staff members by the Regional Safety Officer. Mr. Miller also made a detailed safety inspection of the refuge and filed a detailed report.

VII. OTHER ITEMS

1. Ronald D. Andrews, Biological Technician GS-5 (Temporary) resigned February 23, 1968 to accept a Biologist I position with the Iowa Conservation Commission. Mr. Andrews was interested in a Bureau career but job security and economics won out.

2. Laborer Calvin D. Huffman (WAE) and local science teacher, who worked for us since October 1965 as a weekend naturalist, receiving visitors and explaining our program, accepted a Science Fellowship at Tuskegee Institute, Alabama and is now learning how the other half live.

3. Y.O.C. Carroll Radley transferred to the Kicking Horse Job Corps May 24, 1968. He apparently wasn't prepared for the working world and didn't last long.

4. The Corps of Engineers continue to promote reactivation of their Squaw Creek-Big Ditch proposal. The cut-off from Squaw Creek to the Five Mile Lane Ditch was completed by the Cannon Drainage District and should give the refuge better drainage. The District now requests that we build them a bridge across Highway 111 and close our Penny Lake Slough Spillway. The former would take congressional action and the latter would be absurd until Squaw Creek is widened from the cut-off to the refuge.

5. John Hosking, Senior, Humbolt State College, Arcata, California was picked by the Regional Office as our summer student laborer. He had taken no plant taxonomy and was entirely unfamiliar with our plants and marsh habitat upon arrival but adjusted himself to his primary plant survey assignment. He returned to Humbolt to complete his senior year.

6. Rollin Siegfried, a wildlife management graduate from South Dakota State University with some experience with the Bureau of Commercial Fisheries in Alaska and with the Wisconsin Conservation Department entered on duty here as a Refuge Manager GS-5 trainee, July 1. He and Bonnie live on the refuge. Rollin has been of considerable help particularly with routine refuge operations.

7. Biological Technician A.J. Yocum received an award of $100 for salvaging material and building a bridge across Squaw Creek at considerable savings to the Bureau.

SIGNATURE PAGE

Submitted by:

Harold H Burgess

Harold H. Burgess
(Signature)

Date: March 8, 1969

Refuge Manager
Title

Approved, Regional Office:

Date: MAR 14 1969

Phillip S Morgan

(Signature)

Regional Refuge Supervisor ASST

Photograph #1

Wise owls spend the winter here. A pair of saw-whet claimed the attention of birdwatchers and photographers until March. We believed this little thin one was the male.

Photograph by: William Lonnecker, Davenport, Iowa

Photograph #2

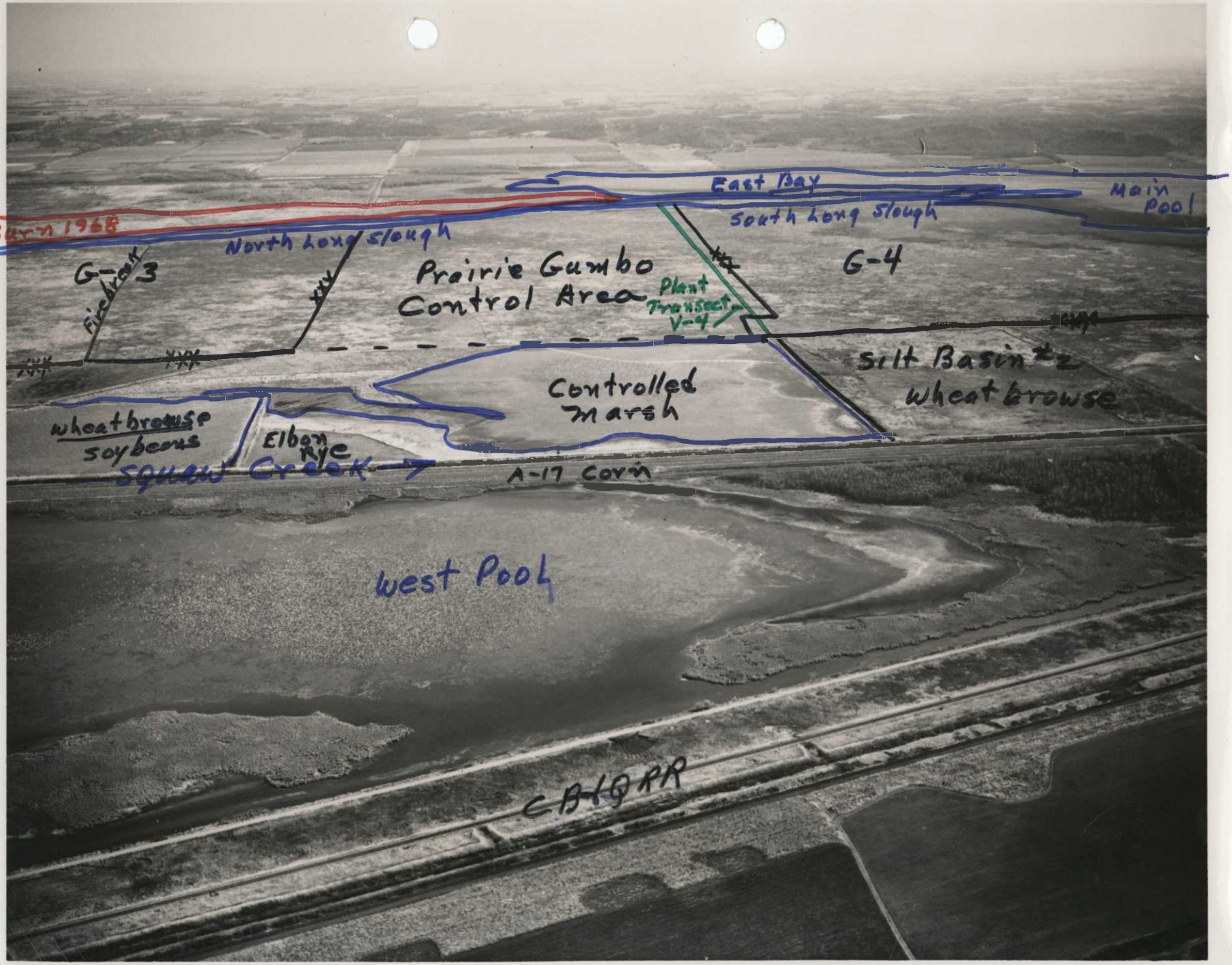
A smart little fluffy owl. We thought she was the female. We don't know what she thought!

Photograph by: William Lonnecker, Davenport, Iowa

Photograph #3

Prairie gumbo management. Grazing was used to increase the attractiveness of the south portion of the wet prairie for waterfowl. Water manipulations are also successfully used in this management where ever possible.

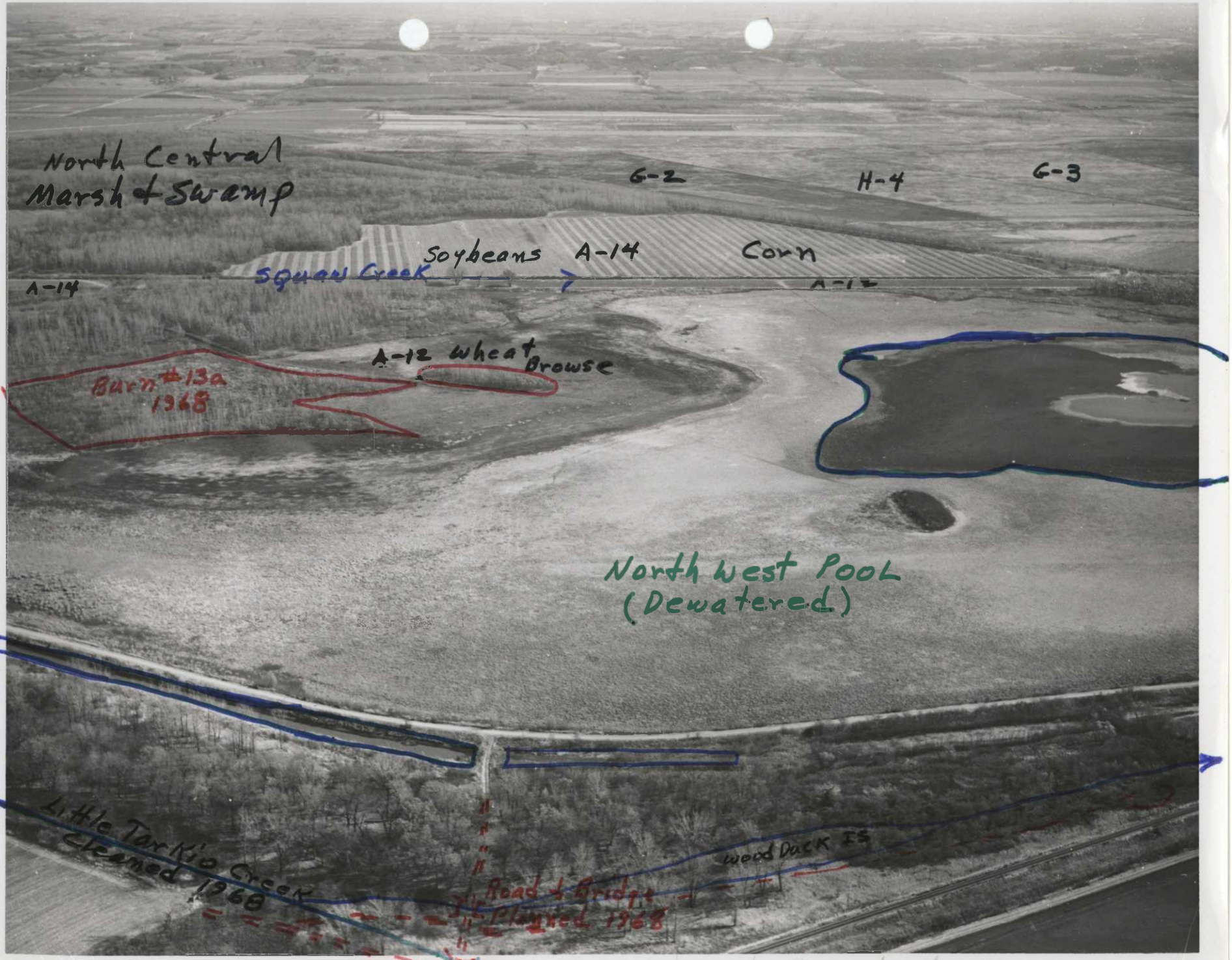
Bureau photograph by: Winship and Burgess


Burn 1968
East Bay
Main Pool
South Long Slough
North Long Slough
G-3
Firebreak
Prairie Gumbo Control Area
Plant Transect V-4
G-4
Silt Basin #2
Wheatbrowse
Controlled Marsh
Wheatbrowse
Soybeans
Elbow Rye
Squaw Creek
A-17 Corn
West Pool
CB&Q RR

Photograph #4

Northwest Pool - Little Tarkio Creek management. Prescribed burning (shown in red) was used to remove debris and to prepare the delta in this pool for geese. Summer drawdown is routine management here. Little Tarkio was straightened by Drainage Districe #2 who will leave the island developed for wood ducks. They will replace the original 3' C.M.P. and trail with a steel and timber bridge and dirt road.

Bureau photograph by: Winship and Burgess



Correct creek alignment and use in refuge copy

Photograph #5

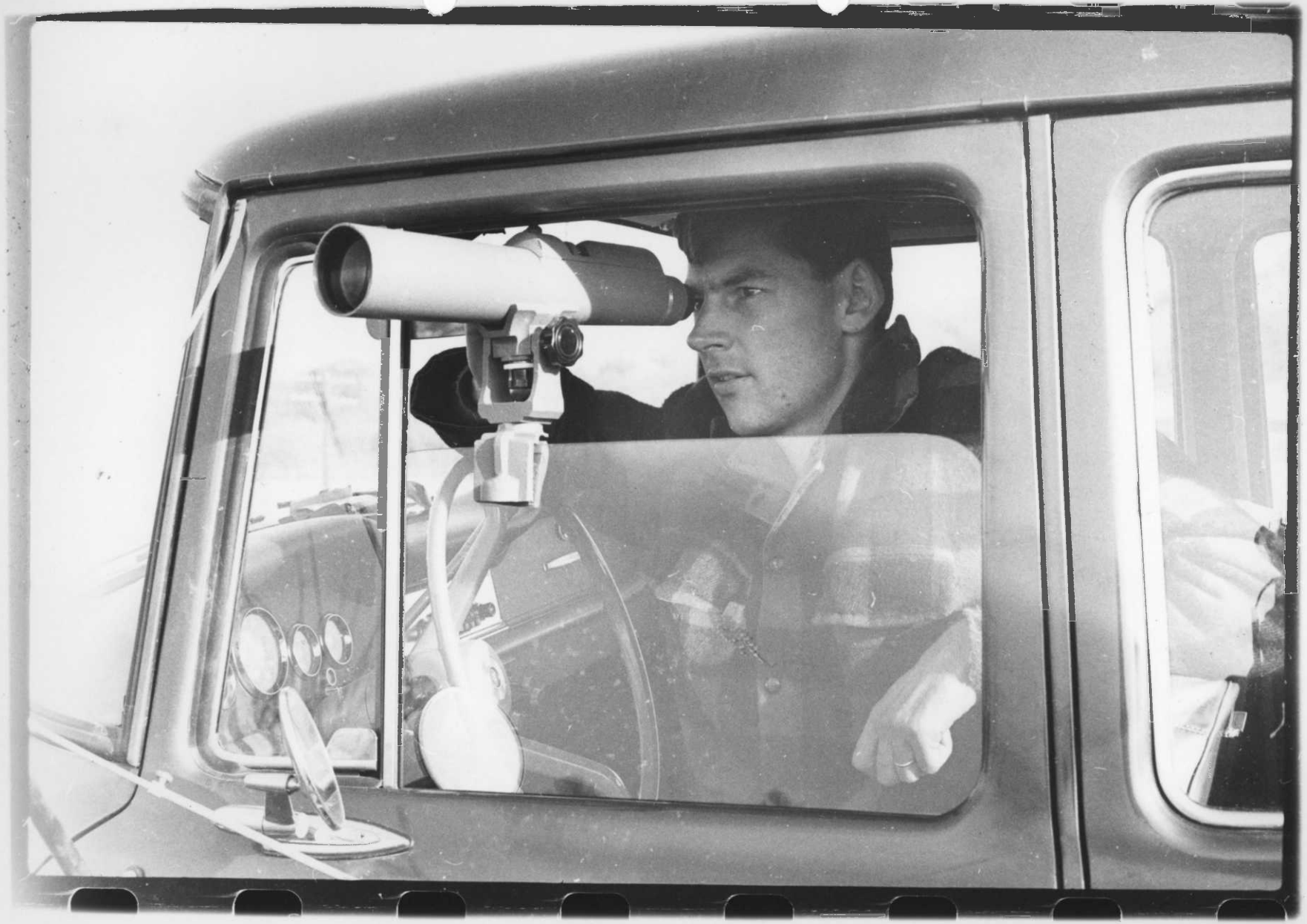
Sanctuary, water and feed sure do bring in the waterfowl at Squaw Creek.

News-Press Photograph by: Don Bradley

Photograph #6

Look who's following the blue geese! Paul Prevett, PhD candidate University of Western Ontario, placed individually marked collars on blue geese on their Northwest Hudson Bay nesting grounds and was following his chums to the Texas coast.

News Press photograph by: Don Bradley



Photograph #7

The Squaw Creek Headquarters Museum. The museum had as many visitors as the rest of the refuge. This section was devoted to big and little Canada geese, until we added the Atlantic brant. Other sections are devoted to "other geese" and ducks.

News Press photograph by: Don Bradley

Photograph #8

A convalescing golden eagle. This eagle apparently followed the waterfowl too close and was crippled by a gunner. It was treated, banded and released at Squaw Creek Refuge. Note the diagnostic white patch in the wing.

News Press photograph by: Don Bradley

PHOTOGRAPH #9

What is waterfowl refuge management all about? Sometimes we forget when we get involved with wild geese or people. Many refuges were established to insure that ducks would continue to prosper so that your children might enjoy them as we have.

Missouri Conservation Department photograph by: Don Woolridge

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MISSOURI DEPARTMENT OF CONSERVATION
PHOTO BY D N WOOLDRIDGE

NEG NO. D634-23
SUBJECT
SERIES
LOCATION
DATE
PHOTO FILE

Photograph #10

A susie mallard. So away with ya, Susan! To your Canadian thistle nesting grounds and return ten fold.

Missouri Conservation Department photograph by: Don Woolridge

CREDIT MUST BE GIVEN TO
MISSOURI DEPARTMENT OF CONSERVATION
PHOTO BY DON WOOLDRIDGE

NEG NO. R634-8
SUBJECT
SERIES
LOCATION
DATE
PHOTO FILE

3-1750
Form NR-1
(Rev. March 1953)

WATERFOWL

REFUGE Squaw Creek MONTHS OF January 1 TO April 28, 19 68

(1) Species	(2) Weeks of reporting period 1 1/1-7/68	2 1/8-14	3 1/15-21	4 1/22-28	5 1/29-2/4	6 2/5-11	7 2/12-18	8 2/19-25	9 2/26-3/3	10 3/4-10
Swans:										
Whistling										
Trumpeter										
Geese:										
Canada Large	3,100	4,000	4,000	3,050	3,050	4,000	4,000	7,200	9,500	9,275
Cackling Small				20	20					470
Brant										
White-fronted									2	25
Snow	67		670	6,000	6,000	6,000	6,000	6,000	40,000	18,100
Blue	33		330	4,000	4,000	4,000	4,000	4,000	20,000	27,200
Other X Total Geese	3,200	4,000	5,000	13,070	13,070	14,000	14,000	17,200	69,502	55,070
Ducks:										
Mallard	50		20,000	21,000	21,000	100,000	6,000	7,000	19,000	71,600
Black			20	20	20	100	60	70	100	70
Gadwall										
Baldpate										
Pintail						100		100	270	11,620
Green-winged teal									100	10
Blue-winged teal										20
Cinnamon teal										
Shoveler										
Wood										
Redhead										
Ring-necked										
Canvasback										
Scaup										
Goldeneye										
Bufflehead										
Ruddy										
Other C. Merganser				100	500	500	100	30	500	500
Total Ducks	50		20,020	21,120	21,520	100,700	6,160	7,200	19,970	83,820
Coot:										

Int. Dup. Sec., Wash., D.C. 37944

3-1750a
Cont. NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE Squaw Creek MONTHS OF January 1 TO April 28, 1968

(1) Species	(2) Weeks of reporting period: 3/11-17 (11)	18-24 (12)	25-31 (13)	4/1-7 (14)	8-14 (15)	15-21 (16)	22-28 (17)	(18)	(3) Estimated waterfowl days use	(4) Production: Broods seen	(4) Production: Estimated total
Swans:											
Whistling											
Trumpeter											
Geese:											
Canada Large	2255	2255	680	500	8	8	8		398,223		
Canada Small	150	150	2000	1500	307	75	60		33,264		
Brant											
White-fronted	695	895	2800	1000	165	22			40,628		
Snow	99400	215000	30000	30000	7715	125	50		3,297,669		
Blue	119100	215000	20000	20000	3305	125	61		3,116,078		
Total Geese	221800	433300	55480	53000	11500	355	179		6,886,082		
Ducks:											
Mallard	53700	53700	25000	20000	3770	950	550		2,963,240		
Black	50	50	200	10	5				5,425		
Gadwall	610	610	700	30	25	160	110		15,715		
Baldpate	700	700	700	50	50	20	20		15,680		
Pintail	15560	11560	9100	3000	1000	910	910		393,330		
Green-winged teal	2370	2370	2500	3100	3100	2400	1000		118,650		
Blue-winged teal		20	300	1000	985	810	470		25,235		
Cinnamon teal											
Shoveler	470	470	1400	4300	4580	2730	700		102,550		
Wood	20	20	20	10	10	10	10		700		
Redhead	10								70		
Ring-necked	200		100	100					2,800		
Canvasback											
Scaup	100	100	100	300	320	10	20		6,650		
Goldeneye	2								14		
Bufflehead				2					14		
Ruddy	10	10	10	8		10	10		406		
Other C. Merganser	65	50	10	20	10	10			16,705		
Other H. Merganser		10			2				84		
Total Ducks	73867	69670	40140	33930	13917	8020	3800		3,667,328		
Coots:		8	2040	1000	1450	1450	1510		52,206		

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans			
Geese	6,886,082	433,300	
Ducks	3,667,328	100,700	
Coots	52,206	2,040	

SUMMARY

Principal feeding areas Surrounding corn fields and marshes.

Principal nesting areas

Reported by Harold E. Burgess, Refuge Manager

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

(1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.

(2) Weeks of Reporting Period: Estimated average refuge populations.

(3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.

(4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.

(5) Total Days Use: A summary of data recorded under (3).

(6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.

(7) Total Production: A summary of data recorded under (4).

Interior Duplicating Section, Washington, D. C.
1953

3-1750
Form NR-1
(Rev. March 1953)

WATERFOWL

REFUGE Squaw Creek

MONTHS OF April 29 TO Sept. 1, 19 68

(1) Species	(2) Weeks of reporting period									
	4/29-5/5	5/6-12	5/13-19	5/20-26	5/27-6/2	6/3-9	6/10-16	6/17-23	6/24-30	7/1-7
Swans:										
Whistling										
Trumpeter										
Geese:										
Canada Large	3					2	1			
Cackling Small	58	1	1	1	1	1	2	2	1	1
Brant										
White-fronted	1	1	1	1	1					
Snow	43	37	20	9	9	7	4	4	1	1
Blue	50	37	20	9	9	5	1	1	1	1
Other Total Geese	155	76	42	20	20	15	8	7	3	3
Ducks:										
Mallard	334	202	150	150	130	60	164	113	104	150
Black										
Gadwall	130	106	75	50	10	4	4		1	1
Baldpate	30	100	25	20	10	4	2			
Pintail	110	186	150	100	20	4	14	10	10	10
Green-winged teal	1730	210	164	100	10	4	5	12	12	6
Blue-winged teal	1630	500	513	500	200	212	66	30	27	10
Cinnamon teal										
Shoveler	1460	1300	741	500	70	40	20	5	4	4
Wood						2	2	7	14	12
Redhead										
Ring-necked										
Canvasback										
Scaup	10		1		7					
Goldeneye										
Bufflehead										
Ruddy	10	10	9	3	3					
Other Com. Merganser		1		1						
Hooded Merganser	1	1	1	1		2	3	3		
Total Ducks	5,445	2,616	1,829	1,425	460	332	280	180	172	193
Coot:	4,700	2,000	770	400	300	150	40	5	5	5

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3-1750a
Cont. NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE Squaw Creek MONTHS OF April 29 TO Sept. 1, 19 68

(1) Species	(2) Weeks of reporting period 7/8-14 11	15-21 12	22-28 13	29/8-4 14	5-11 15	12-18 16	19-25 17	26/9-1 18	(3) Estimated waterfowl days use	(4) Production Broods seen	Estimated total
Swans:											
Whistling											
Trumpeter											
Geese:											
Canada Large	2	2	2	2	2	2			126		
~~Canada~~ Small									483		
Brant											
White-fronted									35		
Snow	1	1	1						966		
Blue	1	1					1	1	966		
Other Total Geese	4	4	3	2	2	2	1	1	2,576		
Ducks:											
Mallard	100	45	104	100	250	250	300	210	20,412		
Black			1						7		
Gadwall	1	1							2,681		
Baldpate							2	10	1,421		
Pintail	8	4	10	100	200	200	600	850	18,102		
Green-winged teal					150	150	630	600	26,481		
Blue-winged teal		10	100	300	700	700	2002	4420	83,440		
Cinnamon teal											
Shoveler	4	4	5	5	10	10	10	10	29,414		
Wood	12	40	30	35	180	180	146	150	5,670	3	18
Redhead											
Ring-necked											
Canvasback											
Scaup									126		
Goldeneye											
Bufflehead											
Ruddy									245		
Other Com. Merganser									14		
~~Coots~~: Hooded Merganser									84		
Total Ducks	125	104	250	540	1490	1490	3690	6250	188,097		
Coot	5	5	5	5	7	7	10	10	8,429		

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans			
Geese	2,576	155	
Ducks	188,097	6,250	18
Coots	8,429	4,700	

SUMMARY

Principal feeding areas: Main, West and Northwest Pools.

Principal nesting areas: Southwest Pool area.

Reported by: Harold H. Burgess, Refuge Manager

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

(1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.

(2) Weeks of Reporting Period: Estimated average refuge populations.

(3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.

(4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.

(5) Total Days Use: A summary of data recorded under (3).

(6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.

(7) Total Production: A summary of data recorded under (4).

Interior Duplicating Section, Washington, D. C.
1953

3-1750
Form NR-1
(Rev. March 1953)

WATERFOWL

REFUGE Squaw Creek

MONTHS OF September 2 TO December 31 19 68

(1) Species	(2) Weeks of reporting period									
	9/2-8 1	9/9-15 2	9/16-22 3	9/23-29 4	9/30-10/6 5	10/7-13 6	10/14-20 7	10/21-27 8	10/28-11/3 9	11/4-10 10
Swans:										
Whistling										
Trumpeter										
Geese:										
Canada				28	1,230	1,280	1,250	4,000	4,810	5,000
Cackling				20	260	345	200	900	900	2,000
~~Brant~~ Ross' Goose								105	116	100
White-fronted	59		1	30	90	90	200	135	100	55
Snow			13	840	84,777	80,000	32,050	72,050	74,240	65,000
Blue	1		3	360	25,323	20,000	10,910	30,850	41,760	34,000
~~Other~~ Total Geese	60		17	1,278	111,680	101,715	44,610	108,040	121,926	106,155
Ducks:										
Mallard	1,100	1,000	600	1,000	16,100	15,600	15,000	30,000	20,000	25,000
Black	10	10	10	10	10	10	10	20	20	20
Gadwall	10	20	10	200	500	2,500	5,000	5,000	5,000	4,000
Baldpate	280	200	120	400	1,000	1,890	10,000	10,000	10,000	5,000
Pintail	5,150	12,010	7,000	16,000	21,000	17,550	50,000	50,000	50,000	40,000
Green-winged teal	1,100	3,000	1,700	10,000	2,000	2,790	5,000	30,000	30,000	40,000
Blue-winged teal	5,950	12,000	14,100	14,000	1,500	1,440	1,000	500	500	100
Cinnamon teal										
Shoveler	400	500	200	400	500	600	1,000	1,000	1,000	1,000
Wood	150	30	50	40	30	10	40	50	50	40
Redhead										
Ring-necked						500	60	50	50	50
Canvasback										
Scaup								1,000	1,000	100
Goldeneye										
Bufflehead								10	10	10
Ruddy						20	10			10
Other										
Total Ducks	14,150	28,770	23,790	42,050	42,640	42,910	87,120	127,630	117,630	115,330
Coot:	30	100	520	3,000	3,050	3,400	3,100	2,100	200	100

Int. Dup. Sec., Wash., D.C. 37944

3-1750a
Cont. NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE Squaw Creek MONTHS OF September 2 TO December 31, 19 68

(1) Species	(2) Weeks of reporting period: 11/11-17 (11)	18-24 (12)	25-12/1 (13)	2-8 (14)	9-15 (15)	16-22 (16)	23-29 (17)	12/30-31 (18)	(3) Estimated waterfowl days use	(4) Production: Broods seen	Estimated total
Swans:											
Whistling	17	1	1	2	2				161		
Trumpeter											
Geese:											
Canada	6250	5500	3750	6000	4480	6300	6300	50	393,346		
Cackling	1500	190	190	200	300	300	200		52,535		
Ross' Goose	108	200	100	90	90	90	10		7,063		
White-fronted	50	55	140	100	2	2			7,763		
Snow	71940	129000	66000	58000	62000	60000	6000	350	6,034,070		
Blue	36060	63300	33000	32000	31000	30000	3000	150	2,741,269		
Total Geese	115908	198245	103180	96390	97872	96692	15510	550	9,236,046		
Ducks:											
Mallard	132150	169490	146830	168750	98100	50000	50000	1000	6,587,040		
Black	130	100	100	22	100	50	50		4,774		
Gadwall	10	10	10						155,890		
Baldpate	750	20	20		10				277,830		
Pintail	15000	1150	1530	100	120	50	50		2,006,970		
Green-winged teal	28200	4000	1600	20	100				1,116,570		
Blue-winged teal									357,630		
Cinnamon teal											
Shoveler	5000	200	110	30	20				83,720		
Wood	40	10	10						3,850		
Redhead	10	9	9						196		
Ring-necked	100								5,670		
Canvasback	10	1	1						84		
Scaup	2100	2	1						29,421		
Goldeneye	4								28		
Bufflehead	100								910		
Ruddy	6	1	1						336		
Other C. Merganser	12	6	26	1					315		
H. Merganser	8	1	2						77		
Total Ducks	183630	175000	150250	168923	98450	50100	50100	1000	10,631,311		
Coot:	10	1							109,277		

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans	161	17	
Geese	9,236,046	198,245	
Ducks	10,631,311	183,630	
Coots	109,277	3,400	

SUMMARY

Principal feeding areas Main Pool

Principal nesting areas

Reported by

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

(1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.

(2) Weeks of Reporting Period: Estimated average refuge populations.

(3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.

(4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.

(5) Total Days Use: A summary of data recorded under (3).

(6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.

(7) Total Production: A summary of data recorded under (4).

Interior Duplicating Section, Washington, D. C.
1953

3-1751
Form NR-1A
(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)

Refuge Sarpy Creek Months of January 1 to April 30 1966

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number Days
I. Water and Marsh Birds:										
Pied-billed Grebe	3	3/18	14	4/21-30	5	4/30				230
White Pelican	8	3/31	2,000	4/14-20	50	4/25				30,000
Great Blue Heron	2	3/28	23	4/14-20	6	4/30				450
Green Heron	1	4/15	2	4/15-30	1	4/15				30
Little Blue Heron	1	3/29	1	3/29	1	3/29				1
Common Egret	1	4/17	10	4/19-30	1	4/30				100
Black-crowned Night Heron	1	4/15	20	4/14-30	13	4/26				300
Yellow-crowned Night Heron	1	4/16	1	4/16-22	1	4/16				7
American Bittern	1	4/17	2	4/17-30	1	4/30				30
Glossy Ibis	1	4/14	1	4/14-29	1	4/19				7
Sandhill Crane	1	3/6	9	3/17-23	9	3/23				75
II. Shorebirds, Gulls and Terns:										
Semipalmated Plover	1	4/14	5	4/21-30	5	4/27				50
Piping Plover	1	4/14	1	4/14-20	1	4/14				7
Killdeer	1	3/8	45	3/11-4/30	2	4/30				1,975
American Golden Plover	1	3/24	22	4/14-20	22	4/20				140
Common Snipe	50	3/31	90	4/8-14	10	4/30				1,500
Long-billed Curlew	1	4/30	1	4/30	1	4/30				1
Willet	14	4/28	14	4/28	14	4/28				28
Greater Yellowlegs	2	3/17	10	4/14-30	10	4/30				150
Lesser Yellowlegs	2	3/17	500	4/21-30	500	4/30				4,500
Pectoral Sandpiper	10	3/24	20	3/24-4/30	20	4/30				600
Baird's Sandpiper	2	3/17	20	4/7-13	20	4/13				130
(Continued)										

(over)

(1)	(2)		(3)		(4)		(5)			(6)
III. Doves and Pigeons:										
Mourning dove	2	12/31/67	100	2/15-4/30	100	4/30				4,500
White-winged dove										
IV. Predaceous Birds:										
Golden eagle	1	1/1	3	2/19-25	1	3/31				100
Duck hawk										
Horned owl	Permanent Residents		40	4/1-30	40	4/30	10	10	10	3,000
Magpie										
Raven										
Crow	8	1/1	500	2/26-3/3	10	3/22				5,400
Sharp-shinned Hawk	1	3/2	2	3/2-4/7	1	4/7				165
Red-tailed Hawk	24	1/1	24	1/1-30	4	4/30				1,620
Harlan's Hawk	3	1/1	3	1/1-3/10	2	3/18				250
Red-shouldered Hawk	1	3/17	1	3/17-23	1	3/17				7
Swainson's Hawk	2	4/7	2	4/7-14	1	4/14				16
Rough-legged Hawk	21	1/1	21	1/1-3/15	3	3/31				1,600
Bald Eagle	46	1/1	105	2/19-25	1	4/13				4,600
(Continued)										

Reported by.....

INSTRUCTIONS

(1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)

(2) First Seen: The first refuge record for the species for the season concerned.

(3) Peak Numbers: The greatest number of the species present in a limited interval of time.

(4) Last Seen: The last refuge record for the species during the season concerned.

(5) Production: Estimated number of young produced based on observations and actual counts.

(6) Total: Estimated total number of the species using the refuge during the period concerned.

INT.-DUP. SEC., WASH., D.C.

59317

3-1751
Form NR-1A
(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)

(Continuation Sheet)

Refuge Squaw Creek Months of January 1 to April 30 1968

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number Days
I. Water and Marsh Birds:										
II. Shorebirds, Gulls and Terns: (Continued From Previous Page)										
Long-billed Dowitcher	100	4/15	100	4/15-30	100	4/27				1,500
Marbled Godwit	1	4/14	1	4/14-20	1	4/20				7
Hudsonian Godwit	50	4/19	50	4/19-30	50	4/30				500
American Avocet	5	4/15	5	4/16-30	1	4/30				45
Herring Gull	3	2/6	3	2/6-3/3	2	4/27				150
Ring-billed Gull	3	2/4	100	3/11-31	50	4/30				2,600
Franklin's Gull	20	4/14	20	4/14-20	2	4/30				140
Bonaparte's Gull	2	4/26	29	4/26-30	2	4/26				150
Forster's Tern	1	4/18	1	4/18-30	1	4/27				12

(over)

(1)	(2)		(3)		(4)		(5)			(6)
III. Doves and Pigeons:										
Mourning dove										
White-winged dove										
IV. Predaceous Birds:										
Golden eagle										
Duck hawk										
Horned owl										
Magpie										
Raven										
Crow										
(Continued From Previous Page)										
Marsh Hawk	10	1/1	10	1/1-3/31	2	4/30				1,000
Sparrow Hawk	1	1/1	2	3/7-4/30	2	4/30				200
Screech Owl	4	1/1	4	1/1-3/15	2	4/30				480
Barred Owl	Permanent	Residents	10	4/1-30	2	4/6	2	2	2	660
Long-eared Owl	2	1/1	2	1/1-3/1	1	4/7				200
Short-eared Owl	12	1/1	12	1/1-2/11	3	3/17				700
Saw-whet Owl	2	1/1	2	1/1-3/30	1	4/1				180

Reported by.....

INSTRUCTIONS

(1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiiformes)
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(4) Last Seen: The last refuge record for the species during the season concerned.

(5) Production: Estimated number of young produced based on observations and actual counts.

(6) Total: Estimated total numbe. of the species using the refuge during the period concerned.

INT.-DUP. SEC., WASH., D.C.

3-1751
Form NR-1A
(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)

Refuge Squaw Creek Months of May 1 to September 1 19x68

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. Water and Marsh Birds:										
Eared Grebe	4	5/5	15	5/15-26	15	5/26				200
Pied-billed Grebe	See prior report		15	5/5-20	5	9/1				370
White Pelican	" " "		170	8/26-9/1	170	9/1				1,200
Double-crested Cormorant	" " "		5	8/26-9/1	5	8/30				50
Great Blue Heron	" " "		107	7/8-8/18	51	8/1				6,000
Green Heron	" " "		5	5/1-20	1	9/1	2	2	4	600
Little Blue Heron	1	7/1	1	7/1-14	1	8/18				50
Cattle Egret	3	6/14	3	6/14-21	1	6/22				20
Common Egret	See prior report		12	8/19-25	1	9/1				100
Black-crowned Night Heron	" " "		57	8/26-9/1	57	9/1				450
Yellow-crowned Night Heron	" " "		17	8/26-9/1	17	9/1				120
Least Bittern	1	5/2	6	5/20-26	1	9/1	1	1	2	600
American Bittern	See prior report		3	5/1-19	1	9/1				400
King Rail	1	5/12	15	7/1-9/1	1	9/1	3	3	15	900
Virginia Rail	1	5/1	41	5/6-12	1	6/1				1,200
Sora	1	5/1	41	5/6-12	30	9/1				1,500
II. Shorebirds, Gulls and Terns:										
Semipalmated Plover	See prior report		400	5/6-12	12	9/1				3,000
Piping Plover	" " "		4	5/1-12	4	5/12				30
Snowy Plover	1	7/7	1	7/7-14	1	7/14				7
Killdeer	See prior report		30	7/15-28	5	9/1	3	3	6	1,500
American Golden Plover	" " "		2	5/1-18	2	5/18				36
Black-bellied Plover	2	5/4	30	5/12-19	3	9/1				300
Ruddy Turnstone	5	5/18	11	5/13-28	1	6/2				100
Common Snipe	See prior report		100	5/6-12	1	5/19				2,000
Long-billed Curlew	1	4/30	1	4/30-5/14	1	5/14				15
Upland Plover	1	7/7	1	7/7-14	1	7/7				7
Spotted Sandpiper	7	5/9	14	5/9-15	4	9/1	3	3	9	450
Solitary Sandpiper	2	5/4	2	5/4-10	2	8/25				30
Willet	See prior report		25	5/1-7	1	8/4				200

(over)

(1)	(2)		(3)		(4)		(5)			(6)
III. Doves and Pigeons:										
Mourning dove White-winged dove	See prior report		300	8/1-9/1	300	9/1	50	50	100	18,000
IV. Predaceous Birds:										
Golden eagle										
Duck hawk (Peregrine Falcon)	1	5/3	1	5/3-17	1	5/16				14
Horned owl	See prior report		40	5/1-9/1	11	9/1	10	10	20	4,800
Magpie										
Raven										
Crow	See prior report		7	5/1-9/1	5	9/1	1	1	3	840
Turkey Vulture	"	"	3	5/20-26	2	9/1				360
Cooper's Hawk	1	5/1	2	5/1-9/1	1	8/18				240
Red-tailed Hawk	See prior report		6	5/1-30	2	9/1				360
Red-shouldered Hawk	1	5/1	1	5/1	1	5/1				1
Broad-winged Hawk	1	8/18	1	8/18	1	8/18				1
Bald Eagle	See prior report		1	7/8-14	1	7/14				7
Marsh Hawk	"	"	2	5/1-9/1	2	9/1				240

Reported by Harold H. Burgess, Refuge Manager

INSTRUCTIONS

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(5) Production: Estimated number of young produced based on observations and actual counts.

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INT.-DUP. SEC., WASH., D.C.

59317

3-1751
Form NR-1A
(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)

Refuge Squaw Creek Months of May 1 to September 1 1968

(Continuation Sheet)

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. Water and Marsh Birds:										
Common Gallinule	1	5/18	1	5/12-19	1	5/19				10
Shorebirds, Gulls and Terns:										
Greater Yellowlegs	See prior report		13	5/1-7	2	7/21				100
Lesser Yellowlegs	" " "		2400	5/1-7	4	9/1				16800
Pectoral Sandpiper	" " "		400	5/1-19	8	9/1				8000
White-rumped Sandpiper	200	5/5	500	5/5-20	30	6/16				7600
Baird's Sandpiper	See prior report		50	5/1-7	1	9/1				400
Least Sandpiper	10	5/4	220	5/6-12	10	9/1				1600
Dunlin	See prior report		300	5/20-26	1	6/2				2100
Short-billed Dowitcher	" " "		10	5/13-7/21	3	9/1				600
Long-billed Dowitcher	" " "		200	5/1-14	25	5/19				2800
Stilt Sandpiper	" " "		700	5/13-19	1	9/1				4900
Semipalmated Sandpiper	" " "		150	5/12-18	12	8/25				1000
Western Sandpiper	1	5/19	2	5/5-19	1	5/19				28
Buff-breasted Sandpiper	1	5/5	12	8/19-9/1	12	9/1				100
II. Shorebirds, Gulls and Terns:										
Marbled Godwit	4	5/16	4	5/13-19	1	7/21				30
Hudsonian Godwit	See prior report		70	5/10-16	8	5/19				500
Sanderling	1	5/5	30	5/13-26	30	5/26				420
American Avocet	See prior report		40	5/1-7	4	5/12				300
Wilson's Phalarope	" " "		600	5/6-12	1	6/16-9/1				4500
Northern Phalarope	2	5/4	82	5/14-20	6	5/26				600
Herring Gull	See prior report		1	5/19	1	5/19				1
Ring-billed Gull	" " "		400	5/6-12	2	9/1				2500
Franklin's Gull	" " "		100	5/13-19	2	7/14				6000
Bonaparte's Gull	" " "		5	5/1-14	5	8/14				70
Forster's Tern	" " "		14	5/1-15	3	9/1				200
Common Tern	2	5/19	2	5/19-24	1	6/23				14
Caspian Tern	6	5/18	30	5/20-26	2	9/1				400
Black Tern	1	5/8	1525	5/8-14	50	9/1				11000

(over)

(1)	(2)		(3)		(4)		(5)			(6)
III. Doves and Pigeons:										
Mourning dove										
White-winged dove										
IV. Predaceous Birds:										
Golden eagle										
Duck hawk										
Horned owl										
Magpie										
Raven										
Crow										
(Continuation Sheet)										
Osprey	1	5/19	1	5/19	1	5/19				1
Sparrow Hawk	See prior report		2	5/1-7/30	1	9/1				240
Screech Owl	"	"	4	5/1-30	4	9/1	1	1	4	480
Barred Owl	"	"	10	5/1-30	3	9/1	1	1	2	1,200

Reported by Harold H. Burgess, Refuge Manager

INSTRUCTIONS

(1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)

(2) First Seen: The first refuge record for the species for the season concerned.

(3) Peak Numbers: The greatest number of the species present in a limited interval of time.

(4) Last Seen: The last refuge record for the species during the season concerned.

(5) Production: Estimated number of young produced based on observations and actual counts.

(6) Total: Estimated total numbe of the species using the refuge during the period concerned.

INT.-DUP. SEC., WASH., D.C.

59317

3-1751
Form NR-1A
(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)

Refuge Squaw Creek Months of September 1 to December 31 1968

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
										Use Days
I. Water and Marsh Birds:										
Horned Grebe	2	9/22	2	9/22-10/13	1	10/12				44
Eared Grebe	3	9/8	3	9/8-22	2	9/22				42
Pied-billed Grebe	3	9/1	50	9/30-10/6	1	10/30				900
White Pelican	800	9/1	5,000	9/7-15	2	12/1				58,000
Double-crested Cormorant	5	9/1	5	9/1-15	1	10/25				80
Great Blue Heron	50	9/1	72	9/23-10/25	1	11/10				4,260
Green Heron	1	9/1	1	9/1-20	1	9/20				20
Cattle Egret	14	9/6	14	9/6-11	14	9/6				70
Common Egret	4	9/2	4	9/1-15	4	9/15				60
Black-crowned Night Heron	4	9/1	33	9/1-7	5	9/29				330
Yellow-crowned Night Heron	6	9/1	6	9/1-15	6	9/15				90
American Bittern	1	9/1	7	9/1-22	1	9/22				44
King Rail	1	9/1	2	9/1-14	1	9/14				28
Sora	1	9/1	30	9/1-22	30	9/22				660
II. Shorebirds, Gulls and Terns:										
Semipalmated Plover	1	9/1	4	9/15-22	4	9/22				43
Piping Plover	2	9/14	2	9/14-20	2	9/20				12
Killdeer	5	9/1	50	9/23-11/28	12	12/1				3,726
American Golden Plover	1	9/21	2	11/18-12/1	2	12/1				86
Black-bellied Plover	14	9/1	14	9/1-15	1	11/16				300
Common Snipe	9	9/1	100	11/11-17	20	12/1				4,800
Spotted Sandpiper	3	9/1	3	9/1-15	3	9/15				45
Solitary Sandpiper	1	9/14	1	9/1-14	1	9/14				14
Greater Yellowlegs	2	9/2	2	9/1-11/2	1	11/2				126
Lesser Yellowlegs	4	9/2	12	9/16-22	1	11/27				210
Pectoral Sandpiper	12	9/1	12	9/1-22	2	12/1				330
Baird's Sandpiper	2	11/17	2	11/17-23	2	11/17				14
Least Sandpiper	15	9/1	15	9/1-7	4	9/22				165
Dunlin	1	9/21	20	11/3-17	3	11/28				350

(Continued)

(over)

(1)	(2)		(3)		(4)		(5)			(6)
										Use Days
III. Doves and Pigeons:										
Mourning dove	80	9/1	80	9/1-7	1	12/27	1	1	0	1,200
White-winged dove										
IV. Predaceous Birds:										
Golden eagle	2	10/28	4	11/18-12/28	1	12/31				200
Duck hawk										
Horned owl	1	9/1	6	9/1-12/31	4	12/31				730
Magpie										
Raven										
Crow	2	9/2	36	10/7-12/21	4	12/31				2,705
Peregrin Falcon	1	9/1	1	9/1-10/7	1	10/7				30
Sharp-shinned Hawk	1	9/15	1	9/15-10/9	1	10/9				25
Cooper's Hawk	1	9/1	2	9/1-12/8	1	12/8				200
Red-tailed Hawk	1	9/2	37	11/27-12/31	6	12/31				580
Harlan's Hawk	1	11/1	3	11/28-12/31	1	12/31				130
Broad-winged Hawk	1	9/14	2	9/14-20	1	9/20				14
Rough-legged Hawk	1	10/4	2	10/4-12/31	2	12/31				96
Bald Eagle (Immature)	1	10/4	104	12/9-28	50	12/31				3,000

Reported by Harold H. Burgess

(Continued)

INSTRUCTIONS

(1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)

(2) First Seen: The first refuge record for the species for the season concerned.

(3) Peak Numbers: The greatest number of the species present in a limited interval of time.

(4) Last Seen: The last refuge record for the species during the season concerned.

(5) Production: Estimated number of young produced based on observations and actual counts.

(6) Total: Estimated total number of the species using the refuge during the period concerned.

INT. DUP. SEC., WASH., D.C.

3-1751
Form NR-1A
(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)

Refuge Squaw Creek Months of September 1 to December 31 1968

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
Continuation Sheet										Use Days
II. Shorebirds, Gulls and Terns:										
Short-billed Dowitcher	6	9/1	50	10/7-23	50	10/23				500
Long-billed Dowitcher	15	9/1	50	10/7-23	2	11/16				1,050
Stilt Sandpiper	15	9/1	40	9/6-22	40	9/22				520
Semipalmated Sandpiper	3	9/1	6	9/2-8	6	9/8				42
Western Sandpiper	1	9/1	1	9/1	1	9/1				7
Buff-breasted Sandpiper	5	9/1	5	9/1-7	5	9/7				35
Sanderling	5	9/15	5	9/15-21	5	9/21				35
American Avocet	1	9/8	12	9/24-28	6	11/10				316
Wilson's Phalarope	8	9/2	8	9/2-22	1	11/17				215
Northern Phalarope	1	9/21	1	9/21-27	1	9/21				7
Ring-billed Gull	2	9/2	10	9/30-11/16	2	12/1				570
Franklin's Gull	1,560	9/10	1,500	9/10-10/23	3	11/3				21,000
Caspian Tern	2	9/1	2	9/1	2	9/1				2
II. Shorebirds, Gulls and Terns:										
Black Tern	40	9/1-7	40	9/1-7	40	9/7				280

(over)

(1)	(2)		(3)		(4)		(5)		(6)
Continuation Sheet									Use Days
III. Doves and Pigeons:									
Mourning dove									
White-winged dove									
IV. Predaceous Birds:									
Golden eagle									
Duck hawk									
Horned owl									
Magpie									
Raven									
Crow									
Bald Eagle (Adult)	1	10/4	70	12/2-8	45	12/31			1,500
Marsh Hawk	3	9/1	20	11/1-12/31	6	12/31			600
Pigeon Hawk	1	10/9	1	10/9-12/8	1	12/8			60
Sparrow Hawk	1	9/1	2	9/1-12/31	1	12/31			244
Screech Owl	2	9/1	4	9/1-11/29	2	12/31			420
Barred Owl	6	9/1	6	9/1-12/31	2	12/30			732
Long-eared Owl	1	11/10	2	11/10-12/31	1	11/10			100
Short-eared Owl	1	12/7	20	12/9-31	3	12/28			440

Reported by Harold H. Burgess

INSTRUCTIONS

(1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)

(2) First Seen: The first refuge record for the species for the season concerned.

(3) Peak Numbers: The greatest number of the species present in a limited interval of time.

(4) Last Seen: The last refuge record for the species during the season concerned.

(5) Production: Estimated number of young produced based on observations and actual counts.

(6) Total: Estimated total number of the species using the refuge during the period concerned.

INT.-DUP. SEC., WASH., D.C.

59317

3-1750b
Form NR-1B
(Rev. Nov. 1957)

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE

WATERFOWL UTILIZATION OF REFUGE HABITAT

Refuge Squaw Creek For 12-month period ending August 31, 1968

Reported by Harold H. Burgess Title Refuge Manager

(1) Area or Unit Designation	(2) Habitat Type	(2) Habitat Acreage	(3)	(3) Use-days	(4) Breeding Population	(5) Production
I	Crops	157	Ducks	2,674,434	20	12
	Upland	91	Geese	3,377,479	8	
	Marsh	552	Swans			
	Water	70	Coots	38,577	5	
	Total	870	Total	6,090,490	33	12
II	Crops	410	Ducks	1,114,638		
	Upland	200	Geese	1,650,775		
	Marsh	250	Swans			
	Water	20	Coots	280		
	Total	880	Total	2,765,693		
III	Crops	510	Ducks	1,345,071		
	Upland	70	Geese	2,496,557		
	Marsh	290	Swans			
	Water	100	Coots	15,624		
	Total	970	Total	3,857,252		
IV	Crops	155	Ducks	169,211		
	Upland	160	Geese	1,489,635		
	Marsh	265	Swans			
	Water	10	Coots	140		
	Total	590	Total	1,658,986		
V	Crops	30	Ducks	9,545,844	140	6
	Upland	10	Geese	6,035,827		
	Marsh	1166	Swans			
	Water	1012	Coots	202,363		
	Total	2218	Total	15,784,034	140	6
VI	Crops	150	Ducks	1,558,207	140	
	Upland	20	Geese	1,006,859		
	Marsh	1125	Swans			
	Water	26	Coots	5,145		
	Total	1321	Total	2,570,211	140	
Totals	Crops	1412	Ducks	16,407,405	300	18
	Upland	551	Geese	16,057,132	8	
	Marsh	3648	Swans			
	Water	1258	Coots	262,129	5	
	Total	6849	Total	32,726,666	313	18

(over)

INSTRUCTIONS

All tabulated information should be based on the best available techniques for obtaining these data. Estimates having no foundation in fact must be omitted. Refuge grand totals for all categories should be provided in the spaces below the last unit tabulation. Additional forms should be used if the number of units reported upon exceeds the capacity of one page. This report embraces the preceding 12-month period, NOT the fiscal or calendar year, and is submitted annually with the May-August Narrative Report.

(1) **Area or Unit:** A geographical unit which, because of size, terrain characteristics, habitat type and current or anticipated management practices, may be considered an entity apart from other areas in the refuge census pattern. The combined estimated acreages of all units should equal the total refuge area. A detailed map and accompanying verbal description of the habitat types of each unit should be forwarded with the initial report for each refuge, and thereafter need only be submitted to report changes in unit boundaries or their descriptions.

(2) **Habitat:** Crops include all cultivated croplands such as cereals and green forage, planted feed patches and agricultural row crops; upland is all uncultivated terrain lying above the plant communities requiring seasonal submergence or a completely saturated soil condition a part of each year, and includes lands whose temporary flooding facilitates use of non-aquatic type foods; marsh extends from the upland community to, but not including, the water type and consists of the relatively stable marginal or shallow-growing emergent vegetation type, including wet meadow and deep marsh; and in the water category are all other water areas inundated most or all of the growing season and extending from the deeper edge of the marsh zone to strictly open-water, embracing such habitat as shallow playa lakes, deep lakes and reservoirs, true shrub and tree swamps, open flowing water and maritime bays, sounds and estuaries. Acreage estimates for all four types should be computed and kept as accurate as possible through reference to available maps supplemented by periodic field observations. The sum of these estimates should equal the area of the entire unit.

(3) **Use-days:** Use-days is computed by multiplying weekly waterfowl population figures by seven, and should agree with information reported on Form MR-1.

(4) **Breeding Population:** An estimate of the total breeding population of each category of birds for each area or unit.

(5) **Production:** Estimated total number of young raised to flight age.

Interior Duplicating Section, Washington, D. C. 27580

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge Squaw Creek Months of January 1 to April 30, 1968

(1) Species	(2) Density	(3) Young Produced			(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres Per Bird	Number broods observed	Estimated Total	Percentage	Hunting	For Re-stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Ring-necked Pheasant	Brush, prairie and croplands								200	
Bob-white Quail	Brush, levees and croplands								50	

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS*

(1) SPECIES: Use correct common name.

(2) DENSITY: Applies particularly to those species considered in removal programs (public hunts, etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) YOUNG PRODUCED: Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.

(4) SEX RATIO: This column applies primarily to wild turkey, phesants, etc. Include data on other species if available.

(5) REMOVALS: Indicate total number in each category removed during the report period.

(6) TOTAL: Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.

(7) REMARKS: Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

*Only columns applicable to the period covered should be used.

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge Squaw Creek Months of May 1 to August 31, 19 68

(1) Species	(2) Density	(3) Young Produced			(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres Per Bird	Number broods observed	Estimated Total	Percentage	Hunting	For Re-stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Ring-necked Pheasant	4,000 acres of upland crops	40	10	200					400	
Bob-white Quail	Brush and forbs	40	5	150					200	

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS*

(1) SPECIES: Use correct common name.

(2) DENSITY: Applies particularly to those species considered in removal programs (public hunts,etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) YOUNG PRODUCED: Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.

(4) SEX RATIO: This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.

(5) REMOVALS: Indicate total number in each category removed during the report period.

(6) TOTAL: Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.

(7) REMARKS: Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

*Only columns applicable to the period covered should be used.

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge Squaw Creek Months of September 1, to December31, , 1968

(1) Species	(2) Density	(3) Young Produced			(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres Per Bird	Number broods observed	Estimated Total	Percentage	Hunting	For Re-stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Ring-necked Pheasant	Brushy margins, prairie and standing crops	11							375	
Bob-white Quail	Brushy margins, levees and standing corn	11							175	

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS*

(1) SPECIES: Use correct common name.

(2) DENSITY: Applies particularly to those species considered in removal programs (public hunts,etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) YOUNG PRODUCED: Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.

(4) SEX RATIO: This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.

(5) REMOVALS: Indicate total number in each category removed during the report period.

(6) TOTAL: Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.

(7) REMARKS: Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

*Only columns applicable to the period covered should be used.

3-1753
Form NR-3
(June 1945)

BIG GAME

Refuge Squaw Creek Calendar Year 1968

(1) Species	(2) Density	(3) Young Produced	(4) Removals				(5) Losses			(6) Introductions		(7) Estimated Total Refuge Population		(8) Sex Ratio
Common Name	Cover types, total Acreage of Habitat	Number	Hunting	For Re-stocking	Sold	For Research	Predation	Disease	Winter Loss	Number	Source	At period of Greatest use	As of Dec. 31	
White-tailed Deer	4,000 acres woods, cord-grass prairie, brush and brushy margins around standing crops	50										200	100	

Remarks:

Reported by Harold H. Burgess

INSTRUCTIONS

Form NR-3 - BIG GAME

(1) SPECIES: Use correct common name; i.e., Mule deer, black-tailed deer, white-tailed deer. It is unnecessary to indicate sub-species such as northern or Louisiana white-tailed deer.

(2) DENSITY: Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge: once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) YOUNG PRODUCED: Estimated total number of young produced on refuge.

(4) REMOVALS: Indicate total number in each category removed during the year.

(5) LOSSES: On the basis of known records or reliable estimates indicate total losses in each category during the year.

(6) INTRODUCTIONS: Indicate the number and refuge or agency from which stock was secured.

(7) TOTAL REFUGE POPULATION: Give the estimated population of <u>each species</u> on the refuge at period of its greatest abundance and also as of Dec. 31.

(8) SEX RATIO: Indicate the percentage of males and females of each species as determined from field observations or through removals.

3-1754
Form NR-4
(June 1945)

SMALL MAMMALS

Refuge Squaw Creek Year ending April 30, 1968

(1) Species	(2) Density		(3) Removals					(4) Disposition of Furs						(5)
								Share Trapping						
Common Name	Cover Types & Total Acreage of Habitat	Acres Per Animal	Hunting	Fur Harvest	Predator Control *	For Re-stocking	For Research	Permit Number	Trappers Share	Refuge share	Total Refuge Furs Shipped	Furs Donated	Furs Destroyed	Total Rare Population
Opossum	All except open water			11			1		11	0		1		30
Short-tailed shrew	" " " "						1					1		Common
Least Shrew	" " " "						1					1		Uncommon
Eastern Mole	" " " "													Abundant
Red Bat	Entire Area													Common
Cottontail Rabbit	All except open water													200
Woodchuck	Levees													4
Franklin's Ground Squirrel	Levees						1					1		5
Gray Squirrel	Upland Woods													20
Fox Squirrel	All Woodlands						2					2		400
Plains Pocket Gopher	Alfalfa Fields						1					1		40
Beaver	Creeks			1	1				1	1		1		10
Western Harvest Mouse	Grasslands						1					1		Common
Deer Mouse	Woodlands						10					10		Common
White-footed Mouse	Grasslands						100					100		Abundant
Southern Lemming	Low Grasslands						1					1		Uncommon
Prairie Vole	Low Grasslands						2					2		Common
Muskrat	Marshes and waterways			10	6		0		5	5	5	6		200
Norway Rat	Building Sites						4					4		Common
House Mouse	Building Sites						100					100		Abundant

* List removals by Predator Animal Hunter

REMARKS:

Harold H. Burgess, Refuge Manager

Reported by _____

INSTRUCTIONS

Form NR-4 - **SMALL MAMMALS** (Include data on all species of importance in the management program; i. e., muskrats, beaver, coon, mink, coyote. Data on small rodents may be omitted except for estimated total population of each species considered in control operations.)

(1) SPECIES: Use correct common name. **Example:** Striped skunk, spotted skunk, short-tailed weasel, gray squirrel, fox squirrel, white-tailed jackrabbit, etc. (Accepted common names in current use are found in the "Field Book of North American Mammals" by H. E. Anthony and the "Manual of the Vertebrate Animals of the Northeastern United States" by David Starr Jordan.)

(2) DENSITY: Applies particularly to those species considered in removal programs. Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottom land hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) REMOVALS: Indicate the total number under each category removed since April 30 of the previous year, including any taken on the refuge by Service Predatory Animal Hunter. Also show any removals not falling under headingslisted.

(4) DISPOSITION OF FUR: On share-trapped furs list the permit number, trapper's share, and refuge share. Indicate the number of pelts shipped to market, including furs taken by Service personnel. Total number of pelts of each species destroyed because of unprimeness or damaged condition, and furs donated to institutions or other agencies should be shown in the column provided.

(5) TOTAL POPULATION: Estimated total population of each species reported on as of April 30.

REMARKS: Indicate inventory method(s) used, size of sample area(s), introductions, and any other pertinent information not specifically requested.

3-1754
Form NR-4
(June 1945)

SMALL MAMMALS

Refuge Squaw Creek Year ending April 30, 1968

(1) Species	(2) Density		(3) Removals					(4) Disposition of Furs						(5)
								Share Trapping						
Common Name	Cover Types & Total Acreage of Habitat	Acres Per Animal	Hunting	Fur Harvest	Predator Control *	For Re-stocking	For Re-search	Permit Number	Trappers Share	Refuge share	Total Refuge Furs Shipped	Furs Donated	Furs Destroyed	Total Population
Meadow Jumping Mouse	Upland Prairie													Rare
Coyote	All except open water			1					1	0				20
Red Fox	Upland Fringe													2
Gray Fox	Low Woodlands													2
Raccoon	All Areas			12					12	0				200
Mink	Low Areas			0	1		1					2		40
Long-tailed Weasel	Grasslands													Rare
Badger	Levees						1					1		Uncommon
Striped Skunk	Margins of Lowlands						2		2					Common
Bobcat	Margins of Refuge													Rare

* List removals by Predator Animal Hunter

REMARKS:

Reported by Harold H. Burgess, Refuge Manager

INSTRUCTIONS

Form NR-4 - SMALL MAMMALS (Include data on all species of importance in the management program; i. e., muskrats, beaver, coon, mink, coyote. Data on small rodents may be omitted except for estimated total population of each species considered in control operations.)

(1) SPECIES: Use correct common name. Example: Striped skunk, spotted skunk, short-tailed weasel, gray squirrel, fox squirrel, white-tailed jackrabbit, etc. (Accepted common names in current use are found in the "Field Book of North American Mammals" by H. E. Anthony and the "Manual of the Vertebrate Animals of the Northeastern United States" by David Starr Jordan.)

(2) DENSITY: Applies particularly to those species considered in removal programs. Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottom land hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

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REMARKS: Indicate inventory method(s) used, size of sample area(s), introductions, and any other pertinent information not specifically requested.

32715

3-1755
Form NR-5

DISEASE

Refuge Squaw Creek Year 19 68

Botulism

Period of outbreak None

Period of heaviest losses _____

Losses:

	Actual Count	Estimated
(a) Waterfowl		
(b) Shorebirds		
(c) Other		

Number Hospitalized	No. Recovered	% Recovered
(a) Waterfowl		
(b) Shorebirds		
(c) Other		

Areas affected (location and approximate acreage) _____

Water conditions (average depth of water in sickness areas, reflooding of exposed flats, etc.

Condition of vegetation and invertebrate life _____

Remarks _____

Lead Poisoning or other Disease

Kind of disease None

Species affected _____

Number Affected Species	Actual Count	Estimated

Number Recovered _____

Number lost _____

Source of infection _____

Water conditions _____

Food conditions _____

Remarks _____

INT.-DUP., D.C.- 53818-59

-1757
orm NR-7
Rev. June 1960)

NONAGRICUL[illegible]AL COLLECTIONS, RECEIPTS, AND [illegible]ANTINGS (1)

Refuge Squaw Creek Year 19 68

	Collections and Receipts (Seeds, rootstocks, trees, shrubs)						Plantings (Marsh - Aquatic - Upland)						
Species	Amount (Lbs., bus., etc.)	(2) C or R	Date	Method or Source	Cost	(3) Total Amount on Hand	Location of Area Planted	Rate of Seeding or Planting	Amount Planted (Acres or Yards of Shoreline)	Amount and Nature of Propagules	Date	Survival	Cause of Loss
Not applicable in 1968													

(1) Report agronomic farm crops on Form NR-8
(2) C = Collections and R = Receipts
(3) Use "S" to denote surplus

Total acreage planted:
Marsh and aquatic _____
Hedgerows, cover patches _____
Food strips, food patches _____
Forest plantings _____

Remarks: _____

3-1758
Form NR-8
(Rev. Jan. 1956)

Fish and Wildlife Service Branch of Wildlife Refuges

CULTIVATED CROPS - HAYING - GRAZING

Refuge Squaw Creek NWR County Holt State Missouri

Cultivated Crops Grown	Permittee's Share Harvested		Government's Share or Return				Total Acreage Planted	Green Manure, Cover and Waterfowl Browsing Crops Type and Kind	Total Acreage
			Harvested		Unharvested				
	Acres	Bu./Tons	Acres	Bu./Tons	Acres	Bu./Tons			
Corn	344	29,240	10	850	256	21,760	610	Winter wheat	580
Soybeans	325	6,500					325	Elbon rye	125
Oats	13	390	4	150			17	Spring oats	80
Winter wheat	85	2,490	53	1,590	252	5,040	390		
Elbon rye			9	270	10	200	19		
Total	767	38,620	76	2,860	518	27,000	1,361		785
								Fallow Ag. Land	

No. of Permittees: Agricultural Operations 8 Haying Operations 3 Grazing Operations 2

Hay - Improved (Specify Kind)	Tons Harvested	Acres	Cash Revenue	GRAZING	Number Animals	AUM'S	Cash Revenue	ACREAGE
Alsike-mixed hay	14.5	40	$43.50	1. Cattle	626	2289	$2,289	1,300
Mixed clover-Reed Canary grass	12	15	36.00	2. Other Horses	2	4.75	4.75	6
Brome	14	15	28.00	1. Total Refuge Acreage Under Cultivation				1,910
Hay - Wild	21	30	$27.50	2. Acreage Cultivated as Service Operation				300

DIRECTIONS FOR PREPARING FORM NR-8
CULTIVATED CROPS - HAYING - GRAZING

Report Form NR-8 should be prepared on a calendar-year basis for all crops which were planted during the calendar year and for haying and grazing operations carried on during the same period.

Separate reports shall be furnished for Refuge lands in each county when a refuge is located in more than one county or State.

Cultivated Crops Grown - List all crops planted, grown and harvested on the refuge during the reporting period regardless of purpose. Crops in kind which have been planted by more than one permittee or this Service shall be combined for reporting purposes.

Permittee's Share - Only the number of acres utilized by the permittee for his own benefit should be shown under the Acres column, and only the number of bushels of farm crops harvested by the permittee for himself should be shown under the Bushels Harvested column. Report all crops harvested in bushels or fractions thereof except such crops as silage, watermelons, cotton, tobacco, and hay, which should be reported in tons or fractions thereof.

Government's Share or Return - Harvested - Show the acreage and number of bushels harvested for the Government of crops produced by permittees or refuge personnel. Unharvested - Show the exact acreage and the estimated number of bushels of grain available for wildlife. If grazing is made available to waterfowl through the planting of grain, cover, green manure, grazing or hay crops, estimate the tonnage of green food produced or utilized and report under Bushels Unharvested column.

Total Acreage Planted - Report all acreage planted, including crop failures.

Green Manure, Cover and Waterfowl Grazing Crops - Specify the acreage, kind and purpose of the crop. These crops and the acreage may be duplicated under cultivated crops if planted during the year, or a duplication may occur under hay if the crop results from a perennial planting.

Hay - Improved - List separately the kinds of improved hay grown. Annual plantings should also be reported under Cultivated Crops, and perennial hay should be listed in the same manner at time of planting.

Total Refuge Acreage Under Cultivation - Report total land area devoted to agricultural purposes during the year.

INT.-DUP. SEC., WASH., D.C. 91767

3-1570
NR-88
(4/54)

REFUGE GRAIN REPORT

Refuge Squaw Creek Months of January through December, 1968

(1) Variety*	(2) On Hand Beginning of Period	(3) Received During Period	(4) Total	(5) Grain Disposed of				(6) On Hand End of Period	(7) Proposed or Suitable Use*		
				Transferred	Seeded	Fed	Total		Seed	Feed	Surplus
Corn, Shelled (Hybrid)	150	875	1,025	none	none	100	100	925		325	600
Corn, Ear (Hybrid)	150	0	150	none	none	50	50	100		100	
Wheat-Winter	100	1,590	1,690	none	100	none	100	1,590	90		1,500
Rye-Elbon		270	270	168	none	none	168	102			102
Bromegrass	45*	200*	245*	none	45*	none	45*	200*	200*		
Oats	100	150	250	none	100	none	100	150	150		

* Pounds

(8) Indicate shipping or collection points Mound City, Missouri

(9) Grain is stored at Refuge Headquarters grainery

(10) Remarks

*See instructions on back.

NR-8a

REFUGE GRAIN REPORT

This report should cover all grain on hand, received, or disposed of, during the period covered by this narrative report.

Report all grain in bushels. For the purpose of this report the following approximate weights of grain shall be considered equivalent to a bushel: Corn (shelled)—55 lb., corn (ear)—70 lb., wheat—60 lb., barley—50 lb., rye—55 lb., oats—30 lb., soy beans—60 lb., millet—50 lb., cowpeas—60 lb., and mixed—50 lb. In computing volume of granaries, multiply the cubic contents (cu. ft.) by 0.8 bushels.

(1) List each type of grain separately and specifically, as flint corn, yellow dent corn, square deal hybrid corn, garnet wheat, red May wheat, durum wheat, spring wheat, proso millet, combine milo, new era cowpeas, mikado soy beans, etc. Mere listing as corn, wheat, and soybeans will not suffice, as specific details are necessary in considering transfer of seed supplies to other refuges. Include only domestic grains; aquatic and other seeds will be listed on NR–9.

(3) Report all grain received during period from all sources, such as transfer, share cropping, or harvest from food patches.

(4) A total of columns 2 and 3.

(6) Column 4 less column 5.

(7) This is a proposed break-down by varieties of grain listed in column 6. Indicate if grain is suitable for seeding new crops.

(8) Nearest railroad station for shipping and receiving.

(9) Where stored on refuge: "Headquarters granary," etc.

(10) Indicate here the source of grain shipped in, destination of grain transferred, data on condition of grain, unusual uses proposed.

INT.-DEP. SEC., WASH., D.C. 17065

3-1979 (NR-12)
(9/63)

Bureau of Sport Fisheries and Wildlife

ANNUAL REPORT OF PESTICIDE APPLICATION

Refuge: Squaw Creek

Proposal Number: 1

Reporting Year: 1968

INSTRUCTIONS: Wildlife Refuges Manual, secs, 3252d, 3394b and 3395.

Date(s) of Application	List of Target Pest(s)	Location of Area Treated	Total Acres Treated	Chemical(s) Used	Total Amount of Chemical Applied	Application Rate	Carrier and Rate	Method of Application
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
6/1-9/30/68	Willow (salix) and other broad-leafed plants	Davis and Squaw Creek Levees	20	2-4-D Ester-L.V.	20# a.e.	1# ae/a.	Water 5 gal/A.	Ground Sprayer

10. Summary of results (continue on reverse side, if necessary)

Retarded growth of willows, smartweeds and other broadleafed plants.

35500

3-1979 (NR-12)
(9/63)

Bureau of Sport Fisheries and Wildlife

ANNUAL REPORT OF PESTICIDE APPLICATION

Refuge: Squaw Creek

Proposal Number: 2

Reporting Year: 1968

INSTRUCTIONS: Wildlife Refuges Manual, secs. 3252d, 3394b and 3395.

Date(s) of Application	List of Target Pest(s)	Location of Area Treated	Total Acres Treated	Chemical(s) Used	Total Amount of Chemical Applied	Application Rate	Carrier and Rate	Method of Application
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
7/15-9/30/68	Johnson grass	Bell Telephone Right-of-way in Section 36	5	Dalapon	35#	7#/A.	Water 25 gal/A	Ground Sprayer

10. Summary of results (continue on reverse side, if necessary)

Treated too late to eradicate but retarded growth.

35500

3-1979 (NR-12)
(9/63)

Bureau of Sport Fisheries and Wildlife

ANNUAL REPORT OF PESTICIDE APPLICATION

Refuge: Squaw Creek

Proposal Number: 3

Reporting Year: 1968

INSTRUCTIONS: Wildlife Refuges Manual, secs. 3252d, 3394b and 3395.

Date(s) of Application	List of Target Pest(s)	Location of Area Treated	Total Acres Treated	Chemical(s) Used	Total Amount of Chemical Applied	Application Rate	Carrier and Rate	Method of Application
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
4/20-5/30/68	Foxtail and other grasses in corn	Ag. Units 1,2,3,5, 7,8,13,14,19 and 20	450	Atrazine 80W	900#	2#/A	Water 20 gal/A	Ground Sprayer

10. Summary of results (continue on reverse side, if necessary)

Good to excellent control of grass and most broadleafed weeds.

3550

3-1979 (NR-12)
(9/63)

Bureau of Sport Fisheries and Wildlife

ANNUAL REPORT OF PESTICIDE APPLICATION

Refuge: Squaw Creek

Proposal Number: 4

Reporting Year: 1968

INSTRUCTIONS: Wildlife Refuges Manual, secs. 3252d, 3394b and 3395.

Date(s) of Application	List of Target Pest(s)	Location of Area Treated	Total Acres Treated	Chemical(s) Used	Total Amount of Chemical Applied	Application Rate	Carrier and Rate	Method of Application
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
4/25-5/20/68	Foxtail and other grasses in corn	A-6,9,12,16 and 17	160	Ramrod	640#	4#/A	Dry	Band

10. Summary of results (continue on reverse side, if necessary)

Fair to good control of grasses. No to poor control of broadleafed weeds.

35500

3-1979 (NR-12)
(9/63)

Bureau of Sport Fisheries and Wildlife

ANNUAL REPORT OF PESTICIDE APPLICATION

Refuge: Squaw Creek

Proposal Number: 5

Reporting Year: 1968

INSTRUCTIONS: Wildlife Refuges Manual, secs, 3252d, 3394b and 3395.

Date(s) of Application	List of Target Pest(s)	Location of Area Treated	Total Acres Treated	Chemical(s) Used	Total Amount of Chemical Applied	Application Rate	Carrier and Rate	Method of Application
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
6/15-7/15/68	Broadleafed weeds in corn	Ag. Units 1,2,3,6, 7,8,9,12,13,14,16, 17,19 and 20	610	2-4-D Amine	915#	1½# ae/A.	Water 20 gal/A	Ground Sprayer

10. Summary of results (continue on reverse side, if necessary)

Excellent control of mid-summer broadleaf weeds. Poor control of morning glories and other late growing weeds.

3-1979 (NR-12)
(9/63)

Bureau of Sport Fisheries and Wildlife

ANNUAL REPORT OF PERSTICIDE APPLICATION

Refuge: Squaw Creek

Proposal Number: 6

Reporting Year: 1968

INSTRUCTIONS: Wildlife Refuges Manual, secs. 3252d, 3394b and 3395.

Date(s) of Application	List of Target Pest(s)	Location of Area Treated	Total Acres Treated	Chemical(s) Used	Total Amount of Chemical Applied	Application Rate	Carrier and Rate	Method of Application
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
5/15-7/15/68	Weeds in soybeans	A-2,3,4,8,6,13 and 14	325	Treflan	487#	1½#/A	Water 20 gal/A	Ground Sprayer

10. Summary of results (continue on reverse side, if necessary)

Fair control. Some difficulty encountered with wild sunflowers and shattercane.

35500